PULP & PAPER INDUSTRY

"The Cellulose Age"

The Management Journal Covering North America's Wood Pulp, Paper and Cellulose Industries.

Presents - -

The North American Review Number for 1946

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. . . which is dedicated to enhancing in every possible way the prosperity, prestige and high principles of the pulp and paper industry.

We consider this fact self-evident—that if any single region of this industry on the North American continent shall prosper, then all must prosper. With this goal ever in mind, this is the only journal in this field with fully-staffed and equipped editorial and photographic offices in all the principle regions of the industry from seaboard to seaboard and from Canada to the Gulf of Mexico.

Of last year's North American Review Number, we received—among many other unsolicited compliments—these kind words:

E. W. Tinker, Executive Secretary, American Paper & Pulp Association: "The statistical information contained in this number makes it almost a must requirement as reference material for some time to come. I am stirred to write you because of the wealth of material you have published."

D. C. Everest, President and General Manager of Marathon Corp., former TAPPI Gold Medal winner and former WPB Pulp-Paper Division Director: "You have certainly done a mighty fine job in getting all the pertinent information relative to the pulp, paper and paperboard industry into one volume. This is indeed a very interesting issue and really constitutes a statistical handbook of great value."

R. S. Kellogg, Secretary, News Print Service Bureau: "Your Review Number brings together more pertinent facts about the North American pulp and paper industry than I have ever before seen between two covers."

W. LeRoy Neubrech, Chief, Pulp & Paper Unit, U. S. Department of Commerce: "It is very obvious that you have put together an excellent array of information and facts on the industry."

Arthur Baker, Yews, New Barn, Longfield, Kent, England: "I regard your journal as one of the best and most informative published on your side of the Atlantic."

We hope this 1946 Review Number will prove just as useful and interesting to this industry.

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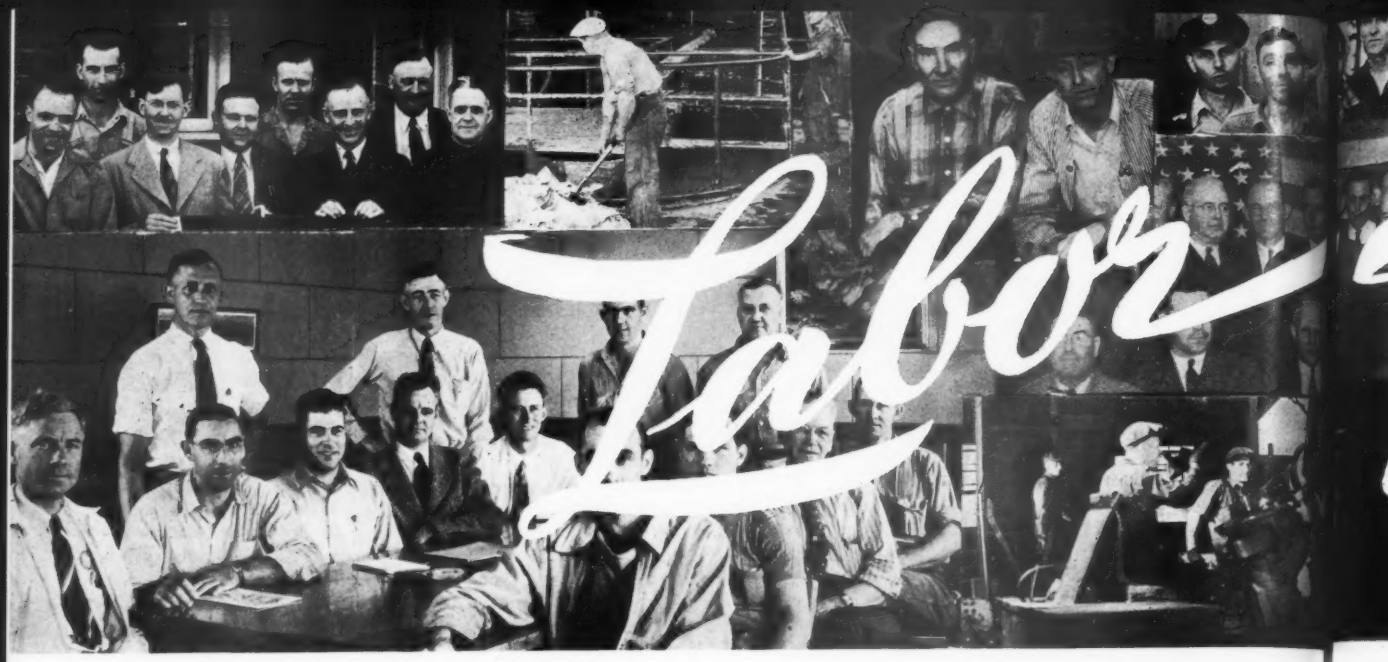


A Survey of Institutions and Devices Which Are Servi St

H. W. PRENTIS, Jr., President, Armstrong Cork Co.—"One of the responsibilities of labor, it seems to me, is to inculcate in the minds of each union local the importance of cultivating the business with which it is associated, just as carefully as a farmer conserves the soil of his farm."

Employe-management relations have never been more important in industry than they are today. In many instances, they probably have likewise never been more misjudged, mishandled and mis-directed.

In an effort to serve both parties in this relationship, PULP & PAPER INDUSTRY has devoted this chapter to a survey of the institutions and other devices in this industry which seem to accomplish most in improving these relations. We deal here with the successful ones—we deal with facts and not theory.

In a continent-wide survey of the actual practices in pulp and paper mills, we have found some outstanding examples of such institutions and devices. Our purpose in this article is to analyze and interpret their values and point out the ones which tend to strengthen and improve employe-management relations.

This survey reveals that those institutions and devices which serve best are the ones that build up an employe's sense of loyalty and responsibility, his feeling of importance and personal prestige.

(A man who has had a great deal of experience in labor psychology, explains it this way: "The incentive to work has less to do with working conditions and wages than an employe's conception of his role and his personal dignity." If this is true, a great deal of energy has been wasted in this field of endeavor.)

Regular meetings at which, not only superintendents and foreman, but lead men and other employes, are told about operation costs and about company plans; papermaking schools; pension-retirement systems; "grass roots" safety and first-aid organizations; suggestion systems; pin or other service-reward dinners; sports teams; picnics; Christmas parties; encouragement to purchase of their own homes by employes—these and other institutions and devices serve this purpose. But that isn't the whole answer. It doesn't take much thinking for any company executive to realize that the way in which these things are done is as important as the "mediums" themselves.

Before going into a discussion of some of the "factual examples" gathered for this article, it might be well to include the comments of a few of the many persons we interviewed:

"Informing the employes of what management is attempting to do results in greater cooperation," said A. B. Milham, president of Bryant Paper Co. of Kalamazoo, Mich.

"We place the greatest importance on cultivating individual responsibility among all our employes and have taken many unusual steps to achieve this," said Neil E. Nash, assistant to the president, Nekoosa-Edwards Paper Co., Port Edwards, Wis.

Evan Wood, personnel advisor of the Everett, Wash., pulp mill of Weyerhaeuser Timber Co., said it in this striking fashion:

"Attempting to describe or to enumerate the things that go to make up a successful labor-management program is somewhat like trying to describe each drop of rain in a cloudburst. It is somewhat like religion—it has to be lived, for it is expressed daily in a thousand different ways."

Robert A. Huston, manager of industrial relations for Kalamazoo Vegetable Parchment Co., said:

"We appreciate the importance of getting information to our employes. No company can expect to eradicate

Strengthen Loyalty and Responsibility Of Employes

all fear and suspicion within its organization. But it is well to realize that fear and suspicion are the children of lack of information."

Another word of wisdom on the subject from Victor C. Gault, personnel supervisor of the Camas, Wash., mill of Crown Zellerbach Corp.: "Union cards do not change people or personalities. If management has good human relations, it will not have any labor problems. There is no substitute for the Golden Rule."

Personnel Executives

During the latter period of the recent war, the executive board of the American Federation of Labor Paper Makers' Union authorized appointment of a research committee to investigate "causes of confusion, dissatisfaction and unrest in the rank and file" of that union. This committee toured mills of the continent and issued a report which seemed to fairly distribute praise and criticism among management, the unions themselves and their members. PULP & PAPER INDUSTRY asked members of this committee for their first-hand observations which would have a bearing on this article.

Chester Jordan, one of the committeemen and a member of Quebec Local 250, Quebec City, Canada, warned that "management certainly falls down on the job when it establishes a good labor relations policy and sincerely intends that it be implemented in a way that will create a contented and loyal group of employes, if it allows departmental superintendents or foremen to ruin that purpose."

Already in this article, the reader may have noted that individuals charged with labor relations at mills have various titles, depending on exactly what the company is trying to do (assuming some thought is given to a title) as for instance, "personnel advisor," "personnel supervisor," etc.

On this subject, Mr. Jordan suggested that "most important factor in establishing and maintaining harmonious labor relations is the personalities responsible." He proposed that the man appointed to handle labor affairs be "allowed to exercise an equal degree of loyalty to both sides . . . (or) be allowed to be neutral and not tied down to an excessive attitude of loyalty to the company."

At one of the Southern United States mills, he said his company found a rather unique arrangement which was proving highly satisfactory and "paying dividends to the company." A man was taken from operations and given the job of interviewing all men who quit or wanted to quit. He heard their complaints and "gripes" and his job was to do all he could to correct them.

He was not "set up in an office with a glass-topped mahogany desk," said Mr. Jordan, but had a cubby-hole in the corner of the time office. His accessibility and the fact that he was "one of the boys," encouraged the malcontent to speak his mind. His job was important during the tight labor conditions but even in easier times, it has possibilities of great advantage to a company.

As for "committee" handling of labor matters, Mr. Jordan thought his own mill in Quebec had the best system he had seen. This is a "Locals' Joint Committee" which takes up complaints and keeps matters on an even keel between two AFL unions. As usual, this committee conducted various drives but one of the unusual jobs it did was buy coal for employes' homes during a shortage and arrange payment by payroll deduction. It organized a fishing club with fishing rights on Canadian crown lands. It set up an income tax office to help employes with tax reports. Management does not interfere with its freedom of discussion and decision in many matters and the committee usually uses the board room of the company for meetings.

(*Mr. Jordan's responses to our*

Vets welcomed at big Midwest mills. At left, Miles Crowe, who lost leg overseas but is doing efficient job nevertheless, is welcomed by L. W. Sutherland, President and Chairman of Sutherland Paper Co., and Mayor of Kalamazoo, Mich. Right, Robert Laut, veteran Coordinator for Kimberly-Clark Corp., greets Martin Wildenberg, company's 1000th vet at Kimberly, Wis., mill. Five Wildenberg brothers, three of them vets, work for K-C and father is pensionee.

Jack E. Hanny, Resident Manager at Camas, Wash., division of Crown Zellerbach Corp., biggest mill in West, greets James R. Reilly, steam plant fireman back from service.

Paul E. Cooper, President of Pacific Mills, Ltd., Ocean Falls, B. C., the farthest northwest mill of North America, welcomes Tom Robertson, a Royal Canadian Air Force veteran soon after his return from overseas and presents him with a company service pin.

inquiries in this survey were so interesting, that PULP & PAPER INDUSTRY *will publish in a later issue a more lengthy article by him on this subject.*)

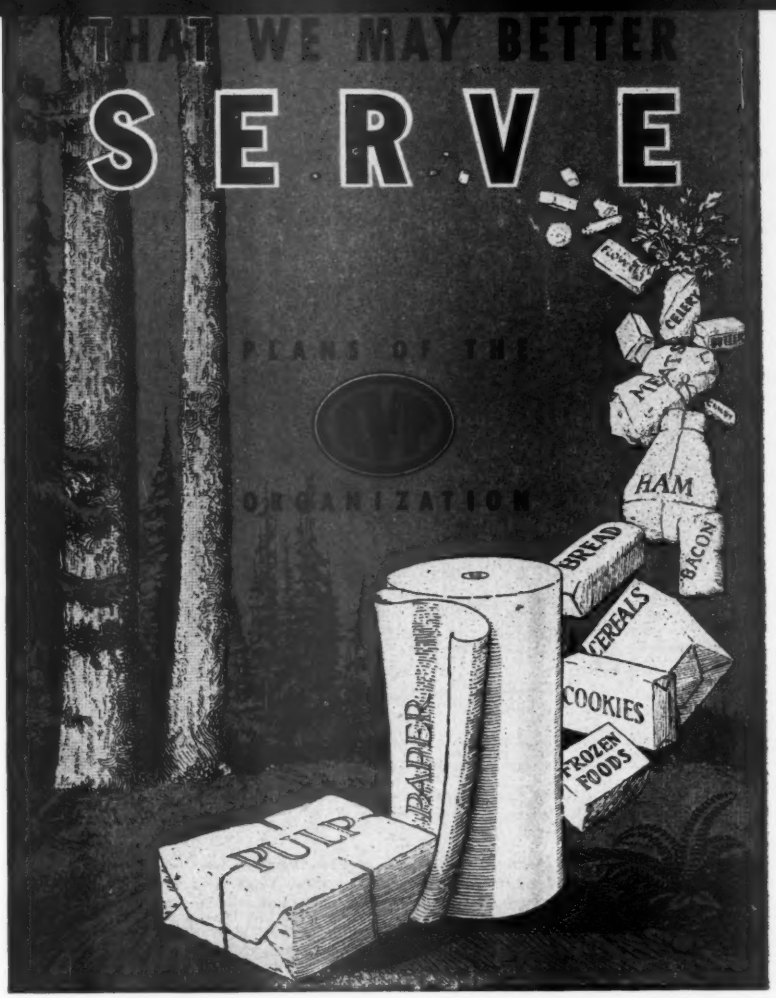
Individual Treatment

A great many ways of introducing a new employe to a mill have been developed by different companies. Instead of discussing a little bit about various plans, it might be more useful to go into more detail about one—for instance, the practice at Nekoosa-Edwards Paper Co.

It is this company's policy to impress upon the new employe the desire of management to employ and retain him as a regular and permanent employe. Each new employe is welcomed into the organization by the employment manager, and through a discussion of his previous education, employment experience, and environment, is given a place in the organization for which, in the best judgment of the employment manager and the prospective employe, he is best fitted and is most likely to progress to the limits of his ability.

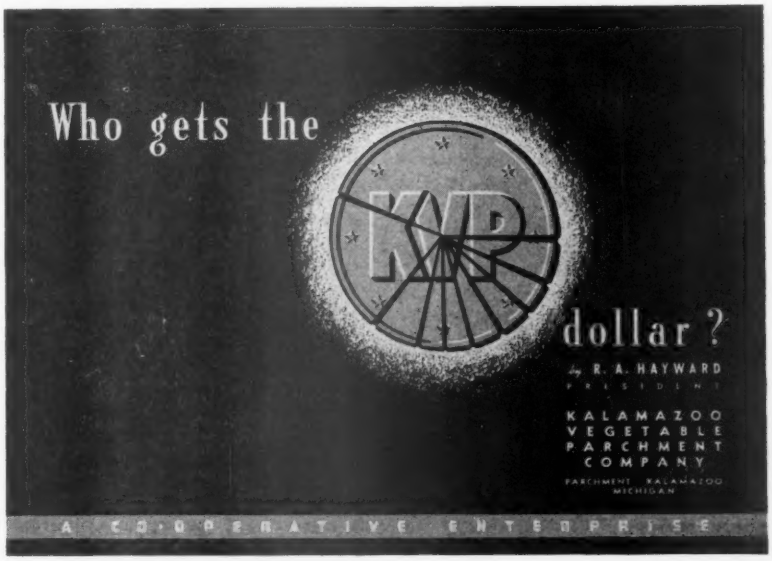
During the initial interview the employe is instructed and advised of company policies, plant rules, and regulations, his own responsibility as an employee, and his privileges and benefits, insurance, compensation, hours, lunch periods, union obligations, his responsibility to supervisors, and his privilege of bringing to the attention of his immediate supervisor, the personnel department, or top management, any problem with which he may be confronted while employed by this company. The prospective employe is made to feel perfectly free to ask questions or give any information he might think pertinent to his employment or abilities and future promotion.

When the employe's placement is decided, his personal records are taken, copies of which are forwarded to the superintendent of the department in which he will be employed, and he is introduced to the safety director who explains the company safety rules, the desire of management for him to be a safe worker, and the advantages of working safely and avoiding accidents and injuries to himself or fellow workmen. At the conclusion of the safety talk, the employee is escorted into the plant where he is shown the various operations and is introduced to his particular job. He is given an opportunity to observe the work and any apparent hazards are



HERE ARE TWO EXAMPLES of booklets published by Kalamazoo Vegetable Parchment Co., of Parchment, Mich., and the titles indicate how they contribute to development of better employe morale and spirit. KVP believes an informed employe will develop healthy ideas more rapidly than an uninformed one.

RALPH HAYWARD, President of KVP, has for six years written letters periodically, which are sent to homes of employes. These are frank discussions of economic problems, company plans, etc. Wives and older children of employes read the letters, and this engenders a closer kinship with the company among the entire family of each employe.



"H..." Out of Hirohito and Hitler
They Guard Fellow Workers Against Home Front Dangers
Producing Pulp for Powder
Cooks and Helpers, Weyerhaeuser Pulp Division
PULP DIVISION CHIPPING PLANT CREWS
Are You Doing YOUR Part to Help Win the War?
Weyerhaeuser Timber Company
LONGVIEW BRANCH
BUY WAR BONDS
BACK THE ATTACK . . . BUY MORE WAR BONDS

Here are examples of a combined public and employe relations idea which made a big bit in the important pulp and paper community of Longview, Wash. This was a wartime effort, but it is not difficult to see how similar ideas might be carried over in peace time.

It is only human nature for individuals to like to consider themselves as important members of their society. In this case, the employes shown in these photographs in a series of newspaper advertisements, truly were "important" in the wartime campaign to produce nitrating pulp. Seeing their pictures in the paper—the Longview News—helped their morale and also, as a result, helped their company and their country.

The Pulp Div. of Weyerhaeuser Timber Co., published an ad every week for five weeks. Here are reductions of three of the ads, headed: "They Guard Fellow Workers Against Home Front Dangers;" "What They Produce Will Blast the H—— out of Hirohito and Hitler," and "Producing Pulp for Powder." In these ads, in the same order, are shown group pictures of the Mill Safety Committee, the two Chipping Plant Crews and the Cooks and Helpers. The ad "copy" identified those in the pictures and told about their accomplishments.

pointed out. He is also introduced to the superintendent, foreman, and workers with whom he will be associated so that when he begins work he will know where and to whom he should go for instruction and advice.

Practices in many other companies vary slightly only in detail. Our survey indicated the more care given to introduction of an employe to his job, the more success he and the company have in all their relations.

Non-Financial Incentives

Among ways and means of encouraging employe interest in his work, one rather unique plan is found to be operating in the Weyerhaeuser Timber Co.'s pulp mills. This idea was originated by R. B. Wolf, manager of the Pulp Division, who has been a pioneer in a great many progressive and enlightened labor policies in the Pacific Coast industry. This plan is in line with what he calls "non-financial incentives."

In the Weyerhaeuser mill operating departments the operators are graded on the basis of daily instrument and laboratory reports on the nearness to standard of various phases of the operation which are entirely subject to the operator's control. These reports are posted in the department with the daily and average-to-date ratings of each man shown for the month.

The standings of the men on these reports have nothing to do with their rates of pay and they are not made as subject for discussion between the man and his supervisor unless the man introduces the matter. The primary purpose is to develop within the individual a sense of pride in his work and his efficiency, as well as to make him realize that the efficiency of his operation has an important bearing on the quality of the finished product.

Dinners, Clubs, etc.

There is a difference of opinion on the value of the company dinners, away from the mill and "work" but, on the other hand, possibly involving too much formality. But anyway, meetings that reach as deeply into the personnel as possible, are highly successful.

For instance, the recent experience of Brunswick Pulp & Paper Co., Brunswick, Ga. During the war this mill, like every other one in the industry, was pushing for production. It was always a case of production, and more production. Soon after V-J Day, the management realized that it was necessary to become quality conscious and to swing the mill over to a quality basis rather than a purely production basis.

This quality program was carefully planned and was launched in December with a dinner meeting for all supervisory employees. At this meeting talks were given by representatives of the mills which utilize the company's product, exhibits of the products made from Brunswick pulp illustrated the story, and its quality campaign was launched. The company followed up with a series of eight dinner meetings for mill employees. Every employe was invited to one of the meetings and also supervisors in charge of those employes attending a specific meeting were also present. At these meetings the quality story was told in general, and specific illustrations were given on how each employe in his job could contribute to a higher quality of product. Brunswick has never made as consistently high quality pulp or as great a production record as in recent months since those meetings.

At Weyerhaeuser Mill

Pulp division, Weyerhaeuser Timber Co., Longview, Wash., has initiated an informal plan by which those at the top can maintain better relations with lead men and others who normally do not attend foremen's meetings. A similar type of contact was gained before the war through what was termed operators' meetings, where at first men were called in by departments. Later, the mode changed to include group representatives of departments, but all to the purpose of talking over operations so the men would gain a clear picture of the future. These small meetings are characterized by simplicity and in-

formality, without obligations or other organizational accoutrements. The method serves its purpose of putting information across to supervisors with a minimum of effort. "If they don't know what the score is, they certainly can't carry it down the line," according to William Haverman, pulp mill superintendent.

Off-the-mill-site dinner meetings, still in small informal units, may later be utilized, but management at this mill remains unconvinced that accruing benefits will outweigh detriments. "By formalizing, part of the effect is lost," Norman Kelly, manager, suggests.

"Longfibre Kraftsmen"

An organization of importance at another Longview mill—Longview Fibre Co.—carries the name of Longfibre Kraftsmen. This organization of key men is mainly composed of salaried personnel, but certainly not to the exclusion of hourly paid employes. Monthly dinner meetings are held with well conceived programs "for dissemination of facts concerning the company and its operation."

Two points projected at the initial meeting on which pooling of knowledge was considered beneficial were: employe training and foremen—employe relations.

The Longfibre Kraftsmen operate through both a program and an arrangements committee, both of which must carry responsibility in making each meeting successful. Confidential matter brought into the discussions help to avoid misunderstanding and foster complete faith.

Out of this organization, Longview Fibre Co. expects emergence of "a closely knit group of men who meet the day-to-day problems of plant operation equipped with similar knowledge of the policies, aims, processes and principles, who know and respect each other as individuals, and who know how to cooperate with each other to the complete exclusion of 'plant politics' and individual jealousy."

KVP and Others in Midwest

Dinner meetings for the supervisors of the big KVP mill in Kalamazoo has been a regular thing, with Ralph Hayward, president of the company, who is a former teacher himself and now is a regent of the University of Michigan, addressing the group. He reports on current conditions and matters of immediate importance at these periodic meetings and then, at an annual meeting for supervisors and union officials, he outlines the company's financial situation and future plans. Plant problems, industry problems, problems of citizenship—these are subjects of Mr. Hayward's talks.

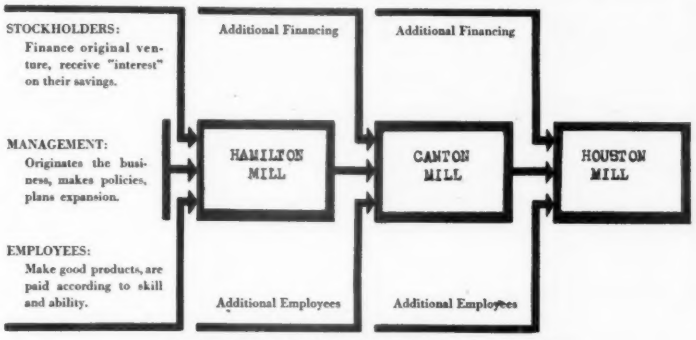
At Nekoosa-Edwards, in Wisconsin, regular meetings of supervisory personnel are conducted at which the value of congenial employe relations are stressed and the supervisor's responsibility for employe relations in his department are emphasized. Discussions between supervisors of methods used to improve employe relations are invaluable especially to the new supervisor who can absorb a great deal of information on methods and technique from the older and more experienced supervisors.

Bryant Paper Co. has at various times included union members in with its foremen's monthly safety conferences and these have been highly successful according to reports.

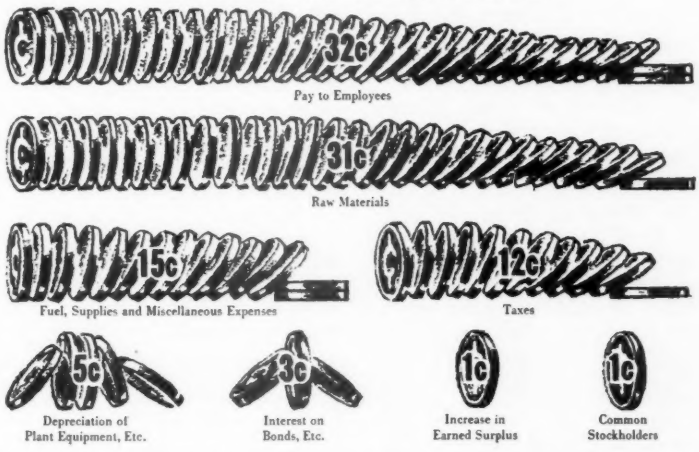
There are many things to be learned by studying the practices of companies in handling such meetings. For instance, at Soundview Pulp Co., biggest sulfite mill in the world which is at Everett, Wash., it has always been the policy to take union officials or their appointed committee into rather complete confidence at all times, where changes in operation or personnel are concerned. The company, which has made some recent important changes, found everything has gone along much smoother by endeavoring not to put serious

HOW STOCKHOLDERS, MANAGEMENT, EMPLOYEES HAVE BUILT THE CHAMPION ORGANIZATION

The following flow chart tells the vivid story of how Champion stockholders, management and employees have all shared in the establishment and expansion of Champion. To each is due a return upon the investment of money and ability and effort each has contributed to the general welfare. Good management will assure each his share of the income.

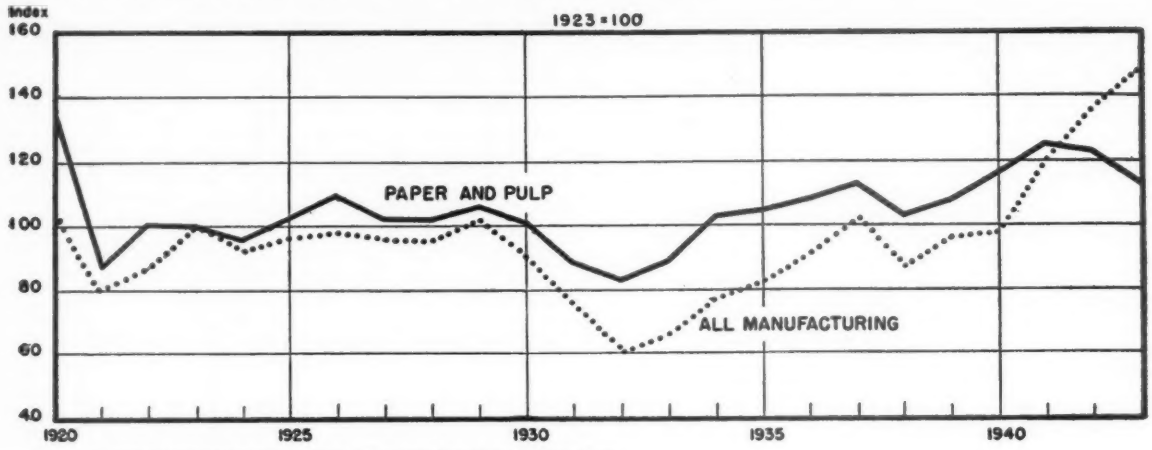


HOW WE SPENT EACH DOLLAR OF OUR INCOME



HERE IS REPRODUCTION OF A PAGE FROM "THE ANNUAL REPORT TO CHAMPIONS" which shows the graphic and effective manner in which Champion Paper & Fibre Co. gets over the idea of "employe participation" in the company. The report goes to each of their employes. Perhaps there's an idea here for other companies in this industry.

U. S. EMPLOYMENT INDEXES—Showing Relative Greater Stability of Pulp and Paper Industry Employment as Compared with other jobs in U. S. industry.



Source: National Industrial Conference Board and American Paper and Pulp Association

labor questions off until the last minute for adjustment. Instead, the management has tried to foresee those problems in which it has mutual interest with the unions, as far in advance as possible, to the end that both parties might have a part in working out solutions.

In the pulp and paper industry on the Pacific Coast it is common practice among the mills to use the tool of foremen's conferences. Practices are not standardized, however, so some mills may use it infrequently and not too effectually toward the low end of the scale of net results and others may use it completely toward top results at the other end. Some mills resort to scheduled regular monthly meetings only; others schedule weekly meetings and intersperse special meetings for select groups whenever the occasion warrants such get-togethers.

The western understanding of the term "foreman," like so many terms subject to interpretation because of application in a given area, includes any person employed in a supervisory capacity, no matter whether he belongs to a union or not, who is responsible for direction of a group of men, even though that group may only include two or three men.

The purpose of assemblage of the foremen's groups is to keep those who must to any extent direct well informed and informed as soon as possible of the functions of management.

One Southern mill manager told PULP & PAPER INDUSTRY that the most urgent labor matter for mills today is to get foremen "on management's side of the table." Fortunately or unfortunately, the company or top management is usually such a nebulous quantity to most workers that the immediate supervisor of any man represents the company to him because in direction of the work he actually becomes spokesman for the company.

If foremen speak authoritatively they therefore represent a company which knows the direction it travels and everyone travels best when he knows his destination. This tends to put foremen in position to counteract baseless gossip. They cannot be embarrassed because they know, and will therefore not have to resort to the old crutch, "Nobody has told me what *they* intend to do." In other words, imparting knowledge to foremen prevents them from being put on the spot. The foreman "belongs," he knows he "belongs," and if he can inform he makes the men "belong" with him.

As one resident manager said, "This method is old as the hills. I don't know of any mill which does not use it. Certainly we have to call the foremen in or even sub-

UNITED STATES PAYROLLS

Average Weekly Earnings of Productive Employees (Exclusive of Converting Employees) in Pulp and Paper Manufacturing.

(Source: Calculated from tables received from A.P.P.A.)

	June to December Inclusive								October
	1937	1938	1939	1940	1941	1942	1943	1944	1945
New England	23.88	22.39	24.27	24.35	29.78	32.63	38.59	41.21	44.71
Middle Atlantic	24.72	24.04	26.74	26.29	31.97	35.84	41.11	43.44	47.50
Lake States	25.79	25.17	26.62	27.52	31.18	34.15	39.15	41.48	43.11
Central (North)	23.65	23.41	25.23	26.03	31.04	31.73	37.19	40.05	41.92
Central (South)	21.09	20.79	21.85	23.25	27.22	30.34	34.32	37.42	37.62
Southern (East)	20.98	21.39	21.82	24.52	28.88	34.71	38.43	43.68	46.76
Pacific Coast	$29.60	$26.49	$30.12	$32.33	$36.54	$43.71	$50.40	$51.66	$49.83

CANADIAN PAYROLLS AND EMPLOYMENT

(Latest Available)

	1942		1943		1944	
	Payroll	No. Employed	Payroll	No. Employed	Payroll	No. Employed
Quebec	$32,715,297	18,496	$33,245,158	18,118	$36,894,543	18,910
Ontario	21,801,085	11,134	22,260,167	11,002	22,266,590	10,864
British Columbia	7,618,433	4,261	8,159,504	3,867	8,411,434	3,901
Other Provinces	7,521,578	4,360	7,534,593	4,033	8,260,841	4,221
Total	$69,656,393	38,251	$71,199,422	37,020	$75,833,408	37,896

U. S. PAPER INDUSTRY AVERAGE AND "REAL" WEEKLY EARNINGS

The table below shows for October, 1945, a comparison of average and "real" weekly earnings by regions, according to the American Paper and Pulp Association.

	Average Weekly Earnings	*"Real" Weekly Earnings*
New England	$44.71	$35.29
Middle Atlantic	47.50	36.93
Lake States	43.11	33.81
Central States	41.92	32.44
Pacific Coast	49.83	37.44
Central Region	37.62	28.83
South	46.76	36.47

Following are average and "real" weekly wages for October, 1945, on an index base of 1935-1939=100, according to the APPA:

	Average Weekly Earnings	*"Real" Weekly Earnings*
New England	196.0	154.7
Middle Atlantic	196.0	152.4
Lake States	177.6	139.3
Central States	184.3	142.6
Pacific Coast	192.2	144.4
Central Region	187.3	143.5
South	232.8	174.5

This tabulation shows that while weekly earnings have risen greatly, their purchasing power has increased to a much smaller extent bcause of increases in the cost of living, the Association states. The increases in the cost of living vary in the several regions. As a result, the difference between regions is less for "real" than for average wages. The difference between maximum and minimum regional current wage is 32.5%, while that between regional "real" wages is less than 30%.

ANNUAL AVERAGES ON EMPLOYMENT TRENDS 1939-1945 PAPER AND ALLIED PRODUCTS
(According to U. S. Bureau of Labor Statistics)

Late 1945 data on employment, hours of work and rates of pay as published by the U. S. Bureau of Labor Statistics show a continued upward trend over previous months for the pulp and paper industry as well as for other non-durable goods manufacturers.

Its data indicates that since 1939 the number of workers in the "Paper and Allied Products" which includes pulp and paper manufacturers, as well as converters, rose from 265,000 in 1939 to 324,000 in December 1945. This was an increase of 22%. At the same time the average number of hours worked each week rose 15% or from 40 to 45.7 hours per week. The result of the increase in the number of workers and the number of hours of work was to raise the industry's effective work week by 35%. It is significant to compare the rate of pulp and paper production during the same period. Paper production rose 28% from 1939 to 1945 while wood production rose 45%.

	Thousands of Wage Earners	*Index of Wage Earners Employment*	*Index Wage Earner Payroll*	*Average Weekly Earnings*	*Average Weekly Hours*	*Average Hourly Earnings*
1939	265	100	100	$23.72	40.1	59.2
1940	278	105	108	24.48	39.9	61.3
1941	314	118	138	27.75	42.0	66.0
1942	315	119	156	31.29	42.1	74.3
1943	321	121	182	36.02	45.2	79.8
1944	312	118	191	38.95	46.0	84.6
1945	312	.....	.....	.....	.....	.....
1945						
Jan.	309	116.5	194.9	40.18	46.2	86.9
July	302	113.7	193.5	40.78	46.3	88.1
Nov.	317	119.3	204.9	41.25	45.7	90.3
Dec.	324	122.2	.....	.....	.....	.....

(For other payroll tables see Pages 37, 152 and 156)

foremen because we must sell any idea to these men first. If we do not get their cooperation through selling *the idea* to them, *we just do not have an idea.*"

M. & O. Community Meetings

Speaking of meetings, the Minnesota & Ontario Paper Co., which about a year ago launched a new and energetic public and employe relations program, under the presidency of Donald D. Davis, former WPB assistant chairman, has found a new type of public assembly that is really successful. It sends its research men, or its woods operations men, to make talks to communities both in and near the mills. These talks have made the entire regions where this company operates understand the objectives and problems of the company much better than they ever had before.

Service Pin Dinners

Pin dinners and service pin dinners have been carried into a "fine art" field by the management of such companies as Crown Zellerbach Corp; Fibreboard Products, Inc.; Gulf States Paper Corp., in the South; KVP in Michigan; Champion Paper & Fibre Co., and quite a few others. The "nubbin" of this technique, it appears, is the development of congenial, confidential atmosphere and talks "straight from the shoulder" from top executives who are willing and able to gracefully "take their hair down."

Clubs for veteran employes are organized in Powell River Co., Everett Pulp & Paper Co., KVP, Champion, etc., and these have similar characteristics and resulting benefits to the company.

One of the biggest companies in the East-South, which asked not to be identified by name, has gone a step farther in this direction than others. This company reported that it established many years ago a continuous service bonus plan which provides for automatic increases in pay based on length of service alone, which constitutes an incentive for continuous service. Each five years of service entitles the employe to an increase of 5% of his base rate up to the maximum of 25%. This program is tied in with age service clubs, to wit: the Five-Year Club, the Ten-Year Club, the Fifteen-Year Club, the Twenty-Year Club and the Twenty-Five-Year Club; the latter two being distinguished as "Junior Old-Timers" and "Old-Timers," respectively.

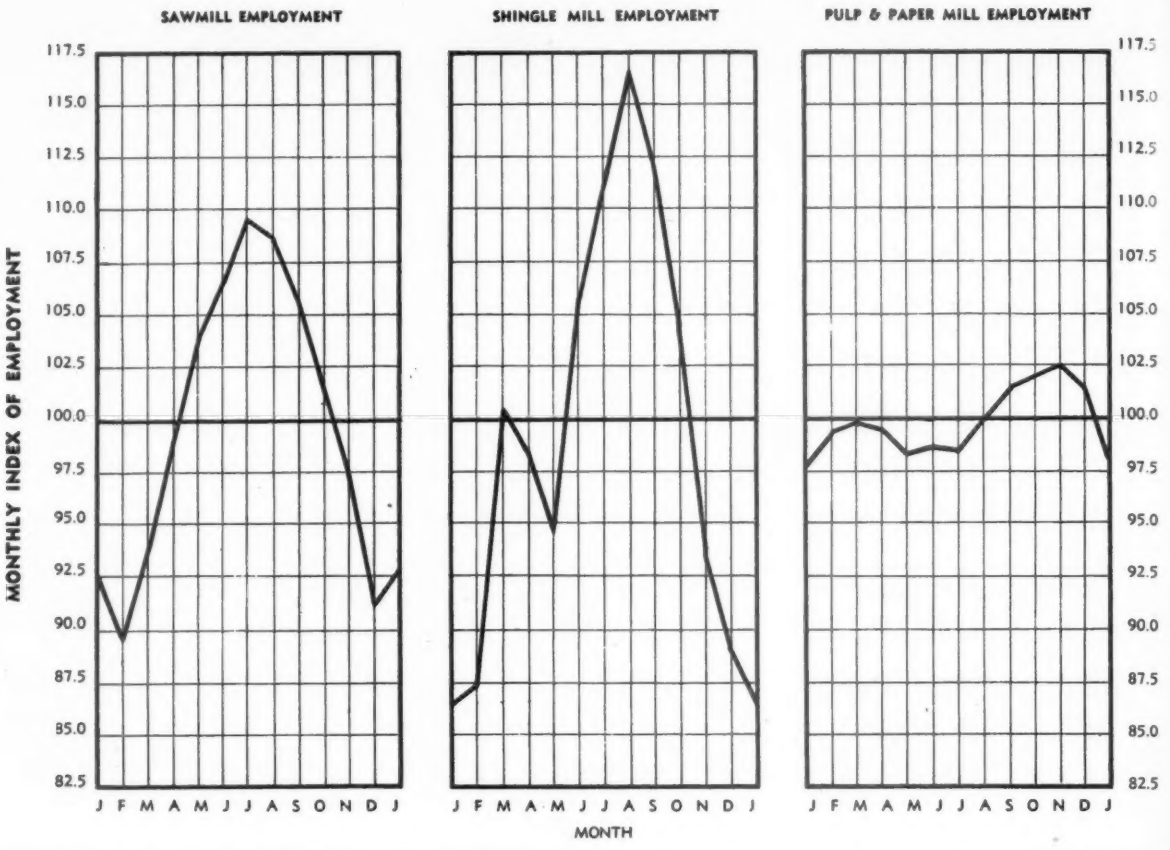
Each club has a banquet or some form of entertainment annually at which new members are presented with an appropriate medal. Upon these occasions management posts the employes on matters of general interest to them involving reports on past activities and plans for the future.

Another variation from more customary plans, is the KVP procedure. For many years, KVP has annually honored employes entering the Old Timers Club. Each year a banquet is given for those who completed ten and 30 years of service. At this banquet KVP usually has a musical or novelty program and a talk by Mr. Hayward. Each employe who has completed ten years of service during the year is then presented with a gold pin and a check for ten days' pay. Those who completed 30 years are given watches with an appropriate inscription engraved thereon and a like check. This Old-Timers' group included 60% of employes during the latter part of last year, but with the influx of a large number of employes this percentage has been reduced.

Wage Conferences

Wage conferences, depending on the method in which they are conducted, can have a great influence on bettering the employe and company relations. The annual wage conferences held by Pacific Coast mills late each spring in Portland, Ore., are a case in point. These have become known as the "goldfish bowl" negotiations because any employe from any mill may be present and hear every word that passes. This is believed to be almost unique, or at least unusual, and the more so because some 33 mills are involved. Just having this right, gives any employe a "sense of belonging."

Actually there are two chairmen,



AVERAGE SEASONAL VARIATIONS AND EMPLOYMENT —The above charts, which graphically demonstrate the stability of employment in pulp and paper industry, as compared with other forest industries, are based on employment in British Columbia. But they are typical of other regions, too, and show that steady employment is a characteristic of this industry. We are indebted to the Canadian Pulp & Paper Assn. for the chart, which is based on official data.

one for the Pacific Coast Association of Pulp & Paper Manufacturers, and one for the unions, and they sit side by side and work in perfect agreement as to procedure and methods of giving the floor to speakers. Only actual members of the negotiating committee—not all official delegates—have the right to speak.

An interesting wage conference is the one held annually by Southern Kraft Division of International Paper Co., where a large group of employes' representatives are invited and far outnumber the customary three representatives of the management. Experience, however, has indicated strong points in this setup. Representatives come from far afield, with eight mills participating. The tendency in other mills of the South is to follow the leads taken in this meeting.

Home Ownership

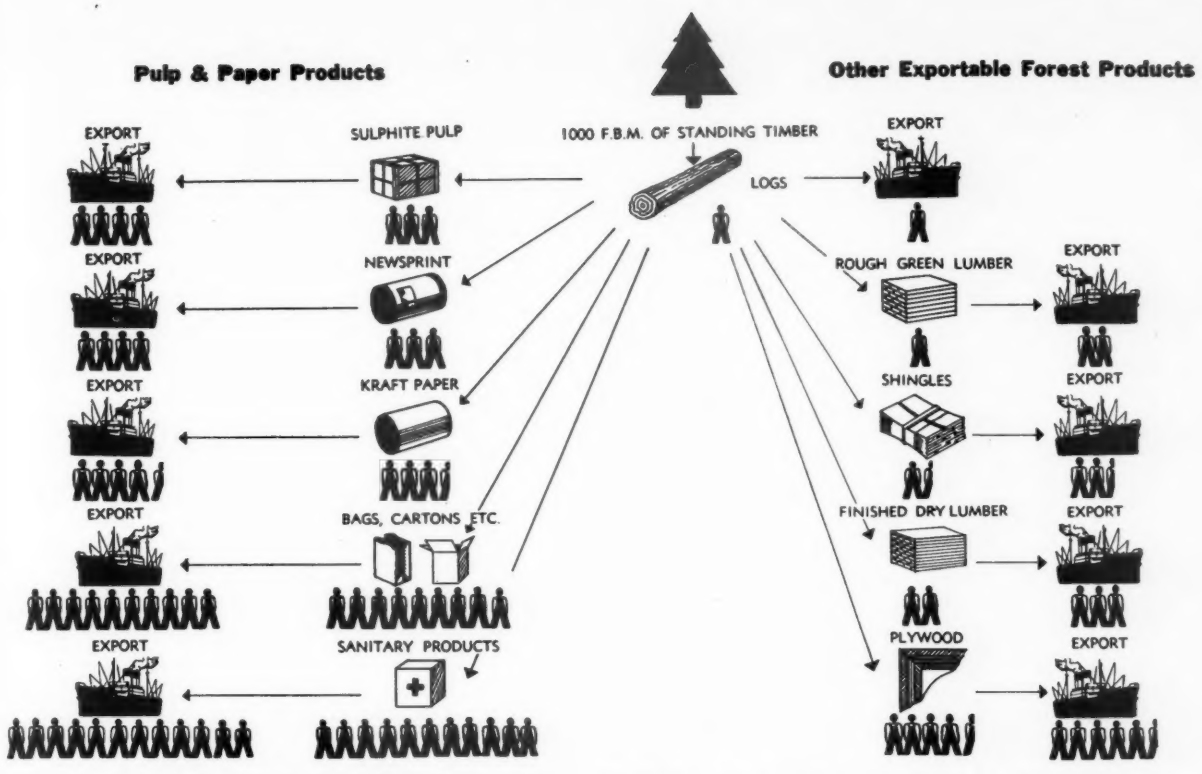
Ownership in homes by the employes themselves is another factor which makes for a strong and congenial labor relationship along with the well-known permanence and stability of employment in this industry. This ownership is a matter which was long close to the heart of such men as the Zellerbachs and their associates in the West and Jake Kindleberger and his successor, Mr. Hayward, at KVP. At a recent Crown Zellerbach dinner in Port Angeles, Wash., it was brought out that virtually all employes with 20 years or more experience owned their own homes—just two bachelors in a group of 41 were not home-owners and company executives said "we are working on them."

Eighty-five per cent of residents of Parchment, the town outside Kalamazoo, where KVP actually is located, own their own homes. The company at first owned the ground, but "Uncle Jake" established for one year a policy that property only be sold to those who built on a lot. He stipulated that such sales should be assisted and encouraged in every way.

The Crossett Industries of Crossett, Ark., where one of the South's important paper mills are located, has now made practical arrangements for returning vets to provide themselves with homes. The Crossett lumber division sold enough land for 84 homes to the Bank of Crossett and cleared sites and built streets. One home only per person and other guards against speculation have been imposed.

"We want our vets to know we have a good plan for them to start a new life," said Peter F. Watzek, vice president and general manager of the Crossett companies.

There is a good case, under certain conditions, for existence of an extensively-company owned town, as set forth by one other big Southern company interviewed by PULP & PAPER INDUSTRY. It held the company, owning homes and facilities, is



PULP AND PAPER INDUSTRY PROVIDES MOST JOBS— We are indebted to the Canadian Pulp & Paper Assn. for the above illustration showing how the conversion of 1,000 feet of standing timber (two cords) to pulp and paper products provides more jobs than for other products. For export paper products, the margin is even greater.

Each man represents one day of direct labor. The data is based on western operations.

in a position to create considerable good will by providing good living facilities and town conditions of which the inhabitants can be proud: a good bank, hotel, theater, filling stations, grocery stores, drug store, general merchandise store, shoe shop, and milk pasteurization plant are the results of company planning the best for the town. Group insurance, group medical care and hospitalization are offered, and a complete recreational program has been underway for several years. The company has provided a community recreational house, swimming pool, baseball park, and several natural woodland parks.

And here is one feature that other mills may find worth emulating: The community interest has been strengthened by annual mill visitation periods for residents, which represent an attempt to familiarize all the citizens with the town's industrial activities.

Company Shares for Employes

Not a new idea, as far as discussion of it goes, but new in actual practice, are schemes giving employes actual shares in a company.

Under an income-deduction plan in which the parent company shares part of the cost, employes of Scott Paper Co. have become eligible to purchase Scott Paper Company stock.

No more than $10 a week nor less than $1.50 a week may be set aside for the purpose by the employe. Top investment cannot exceed 15% of wages or salary earned, to which the company will contribute an additional amount equal to 15% of the purchase.

From a fund accumulated by the company stock will be purchased on the open market on the New York or Philadelphia stock exchanges. No new issues of stock are being marketed for the purpose.

Crown Willamette Paper School

This type of article would neither be complete nor of full value to our readers unless we analyzed also the benefits derived from that unusual institution—the Crown Willamette Paper School, which is conducted by Crown Zellerbach Corp. at Camas, Wash., and which has recognized right to credits in two western state universities.

Some of the material presented is given by the mill resident manager himself under the title of "Mill Management" and covers details of how he handles his responsibilities as manager for the corporation. This is a first year class. Other of the first year courses cover "Purchasing Costs" as presented by the purchasing agent; "Mill Accounting," given by the office manager; and "Orders, Programming and Shipping" as presented by the head of the order department. In the second year a good deal of operational data, including information on raw materials used, maintenance handling, and electric power and steam power used, are discussed, both as to supply and quantity. In third and fourth year courses, the students actually pursue methods similar to those employed by graduate students in standard universities and will be given answers to any questions pertaining to operation of the plant.

After employes have taken part or all of the course they have the

feeling they are an important part of the company. No one stresses the point. But all jobs become oriented. And the feeling generates of itself thereafter from the material and the manner of its presentation.

This school includes among its students not only employes of the Camas mill, but as well any who wish to take the course from the West Linn, Ore., division, Western Waxing Paper division of North Portland, Ore., and the employes of the Portland office staff. The course throughout its four years is designed to present basic information which is understandable and acceptable on the conduct of company affairs. The school thus gives contacts for top management including the foremen with the men which can be secured in no other way because this is a new relationship. Executives step out of the role of order givers into an undiscriminating but interested position—that of an imparter of knowledge. This teacher-student contact has a psychological advantage over any other sort of human relationship. To attempt to teach is to extend "a helping hand."

Crown Willamette Paper School was instituted on Sept. 18, 1933, under sponsorship of Assistant Manager A. G. Natwick and M. W. Phelps, at that time Camas mill technical supervisor but now with the Solvay Co., Syracuse, N. Y. The prospectus set up "a proposed course in the manufacture of pulp and paper," and a student quota for each department was figured, with each supervisor recommending those students who should take the course. The staff in its original year consisted of the two men above named together with R. J. Schadt, one of the Camas mill chemists who is now resident manager of the Crown Zellerbach division plant at Carthage, N. Y. This school in its thirteen years of existence has grown to enroll from 100 to 175 students a year. Crown Z executives say the school pays dividends in better relations and more efficient operation.

The Camas school has won an international reputation and, in addition to many inquiries that have been made concerning its curricula, methods, etc., from American and Canadian mills, inquiries also have come from Russia, India, Norway, Sweden and Finland.

ERIC JOHNSTON, President, Chamber of Commerce of the U. S.—"Stubbornness is not in the facts (of labor-management strife) but in the men called upon to deal with the facts."

One other large American pulp and paper company is working out a somewhat different plan. This company, fortunately, has a veteran technical and research executive who is unusually well qualified by temperament to be a teacher and the plan is to have him make the rounds of the company's mills, holding courses at each one.

The University of Wisconsin has cooperated with mills in that state, providing instructors who travel to the mills. Generally, educational work tends to strengthen employes' loyalty and interest.

Canadian Night School

An interesting feature of employee education has been introduced by Pacific Mills, Ltd., at its converting plant in Vancouver, where an employees' night school has been in operation. These classes hold fortnightly meetings during the winter months and they are designed to instruct employees in the general aspects of the pulp and paper industry as well as in the policies and methods of their own company.

Classes are held in such subjects as papermaking, printing, waxing and gumming. The classes also visit other paper converting plants.

The Pacific Mills supervisory staff has found these classes effective in that the employee's interest, both in his own job and in the company, is stimulated. They provide an opportunity for the supervisors to become better acquainted with the men, their interests and attitudes. Through the medium of group discussions the supervisors are able to discover the employees most interested in their work and who show special aptitudes.

The company also operates at Ocean Falls an apprenticeship plan for boys of 18 whereby they are able to qualify for training in several trades—electrical machine shop practice, welding, sheet metal work, pipe-fitting and foundry work.

A new idea in education is the formation of a Powell River Forestry Association for Powell River Co. employes at the big mill on the British Columbia coast. The principle of the organization is that people who work in pulp and paper mills and owe their livelihood to the forests ought to know more about them. Incidentally, the company's interests and problems will be better understood by their employes.

Job Training

Job training programs received considerable impetus during the war with "Training-within-Industry" programs and with government assistance to boost war effort. In the U. S. and Canada these ideas still are being utilized.

Powell River Co., for instance, reports that increased efficiency and improvement in workers' morale as a result of job training have more than justified the time and cost of the procedure and made this form of instruction indispensable.

W. E. MacGillivray, superintendent of the groundwood department of Powell River Co., has played an important role in job training.

"Production of groundwood pulp, like almost every process in the mill, is an art rather than a science," says Mr. MacGillivray. "A grinderman who must keep six pockets constantly fed with blocks of spruce or hemlock has to exercise judgment as well as mechanical knowledge and skill if the end result is to meet specifications. He must learn to regulate the grinding of wooden blocks which vary in toughness.

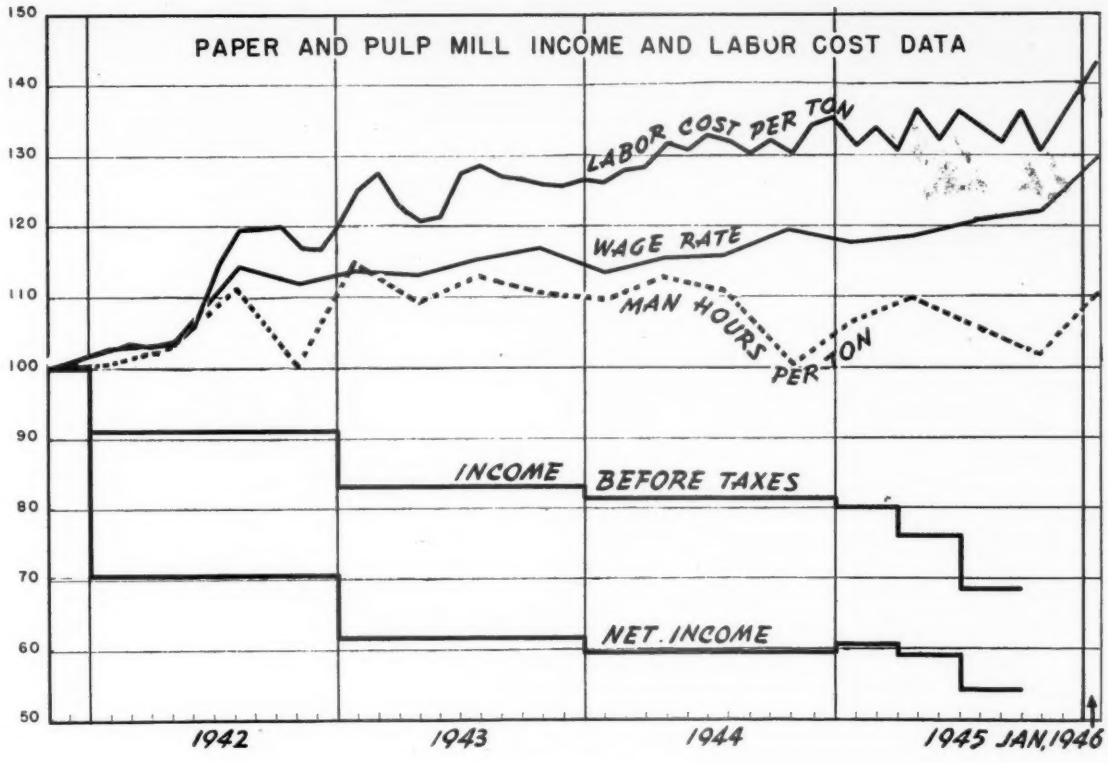
"For breaking in grindermen we have instructors who coach the new employees along step by step. This plan has replaced the one previously in effect where the new man watched an experienced worker for a few days and then took over full responsibility.

"The trained instructors break the job down into stages which they estimate are enough to be assimilated at one time. Then they satisfy themselves that the new man has mastered each successive step before being introduced to the next. The underlying principle is that if the learner has not learned his job, the instructor has not performed his properly.

"This systematic training replaced the old idea that if a man did not pick up knowledge and skill on his own account he would not be a success. The new way places responsibility on the instructor as well as on the new man."

(Continued on Page 154)

LORD MOULTON, English lawyer—"There are three areas of human conduct: The area of complete freedom, the area of complete legal control, and, in between, the area of good manners."



This chart is based on American Paper & Pulp Association monthly surveys showing labor cost factors in papermaking in relation to profits. The index basis: October 1941—100.

We have extended the labor cost lines of this chart with assistance of APPA surveys into January, 1946. Of course, the lifting of excess profits taxes in late 1945 has curbed the widening of the gaps shown here, but there still would be a substantial gap shown. Since 1941, it will be noted that the profit lines are all below 100, while all labor cost data is above.

Pulp and Paper Prices and Costs

The price increases of about 10% which the pulp industry obtained under the OPA ruling announced Apr. 11, 1946, should generally result in a healthier pulp industry on the North American continent. It is estimated that this will bring to all pulp producers serving the U. S. market additional annual revenue of $17,000,000 to $19,000,000.

The price was aimed at encouraging more Swedish pulp imports, meeting the world market price substantially, but as for efffect on the U. S. and Canadian companies, it will probably encourage them to go out after more high cost marginal wood and thus not only increase their output, but put themselves in a better long term position as to resources.

The users of pulp and converters were pressing OPA for a price revision, too.

Recently the American Paper & Pulp Association issued a graph showing the relationship of profits to labor costs in papermaking and this is reproduced here.

The chart shows how profits have declined in relation to cost. Labor costs range as high as 50% of the total in mills. So, the increase in labor costs is certainly an important reason for the drop in profits shown in the chart.

It takes 3.9 percent more man hours to produce a ton of paper now than it required in 1941, a factor which may be partly due to production of light weights and higher grades and partly to less efficient labor. At no time since October, 1941, has it taken less man hours to a ton of paper.

The graph is based on AP&PA monthly surveys. The entire year has been used as the base period (100) for profits before and after taxes. It is clear that profits both before and after taxes have been dropping steadily since 1941. An increase of Federal taxes have dropped the profits further than the drop before taxes.

Profit figures in the graph are plotted on an annual basis. Since 1941 it will be noted that all the profit lines are below 100, while all labor cost data is above. Behind the rugged facts of the chart, the executive can also see other costs on the rise: wood, fuel, maintenance, pulp, waste paper and rags. Stumpage has advanced most sharply in some areas.

Also significant is the fact that base wage rates in the industry have already risen about four per cent more than the cost of living—a base pay rate of 132.6 in the paper and pulp industry (above January, 1941, the date the President set as a base) as compared with the cost of living figure of 128.9.

JUSTICE BRANDEIS—"Democracy is that form of government which substitutes self-restraint for external restraint."

North American mills spend $250,000-$300,000 annually to improve streams. National Council sponsors new projects in West, Midwest and South.

According to information informally gathered by PULP & PAPER INDUSTRY, the United States and Canadian manufacturers in this industry spent from $250,000 to $300,000 during 1945 in cooperative efforts to find economic means of minimizing, neutralizing or utilizing the stream effluent from pulp mills. They will spend as much again in 1946 in cooperative enterprises.

Individual companies are probably spending an equal or greater amount.

That estimated expenditure, which is certainly a conservative one, based on data gathered by the editors of this magazine in all regions of the North American continent, probably will surprise a great many critics of the industry.

Some political leaders, fishermen, nature "lovers" and others who are often critical of the industry, have stated or implied publicly that the pulp and paper mills are doing nothing about the troublesome stream problems. Some of these individuals, when apprised of this big expediture, which is made with no positive assurance of practical return for investment, frankly admitted their amazement.

Now that government bodies are turning from war problems to peacetime matters, it is believed they may give more attention to stream pollution or de-oxygenation (it has frequently been pointed out by this magazine that sulfite mills do not actually "pollute" streams), much of which is caused by cities or other installations than pulp mills. There are a number of bills before the U. S. Congress but so far these have been pigeon-holed.

A new Washington State Pollution Commission was organized during the past year and in Minnesota a similar body has been created. Similar activity has been reported in other regions. In some cases, the new commissions and laws have been fairly reasonable, permitting mills possible recourse to the constituted courts of the state in any action and otherwise giving the affected companies some just means of defending their interests.

Problem for Half Century

Stream problems are no new subject of study by these mills. For half a century at least, different companies have been trying to find means of eliminating the mill waste or using it in a way that would be either profitable or at least not put their operations in the red.

Now cooking processes are being introduced in a few sulfite pulp mills, which may prove a means of solving their effluent problems and utilizing the waste liquor, but these have not yet been beyond pilot plant stages and have yet to be demonstrated as successful on a commercial basis.

However, if the investments in these enterprises were added to the (at least) $250,000 spent during 1945, as contributions to solving these problems, the total would be several millions.

No. 1 investment in this research is that of the National Council for Stream Improvement, to which mills in 35 states contribute. Its annual 1946 budget of $140,000 is spent in research in several localities.

The research project of the University of Washington, to which 20 Washington state pulp and paper mills have pledged themselves to contribute $300,000-$500,000 in a five-year period which ends Jan. 1, 1949, is No. 2. These contributions, at a rate of at least $60,000 per year are pro-rated on a production tonnage basis among the mills.

An augmented staff at the University, including a number of specialists giving full time, are working on several different studies. Even before this project was inaugurated, the University was carrying on studies in search of commercially feasible methods of extracting ethyl alcohol, lignin derivatives and inorganic chemicals from sulfite waste liquor.

At the Pulp & Paper Institute of McGill University in Quebec, the Canadian pulp and paper industry has for a number of years been financing research in similar matters.

The Wisconsin pulp and paper industry also has expended large sums in research on waste liquor. The mills of that state financed the trickling filter process for treatment of sulfite waste in a pilot plant at the Interlake mill of Consolidated Water Power & Paper Co., in Appleton, Wis., and also the development of the river aereation process on the Flambeau River in Wisconsin.

Also at Appleton, the kraft mills of Wisconsin financed research in toxicity of black liquor on fish life.

Mills,. individually, have in many instances spent considerable sums in research or experiment, probably.

In its scope and counting mill participation, the most important of all the undertakings of this kind is the organization of the National Council for Stream Improvement (of the Pulp, Paper and Paperboard Industries), Inc., whose research projects are paid for on a pro-rated basis by several hundred mills.

This National Council has now taken over sponsorship and financing of the various Wisconsin projects mentioned above.

History of Council

On Apr. 22, 1943, the organizing committee composed of the industry's outstanding and forward-looking executives, met in New York and drafted the certificate of organization and by-laws of the National Council.

A board of governors was appointed which met May 14, 1943, and appointed appropriate committees, fixed the assessment rates and prepared a plan for the solicitation of members on a national basis. Prior financial support of the corporation's activities was pledged by some 21 pulp and paper companies.

Outstanding among these previous cooperative efforts of the pulp and paper industry were those of the Sulfite Pulp Manufacturers' Committee on Waste Disposal, a committee organized by a group of

HERE'S WHAT THIS INDUSTRY IS DOING ABOUT STREAM PROBLEM

On this map are shown locations of projects or research undertakings financed by most of the pulp and paper mills of North America in an effort to dispose of, neutralize or utlize pulp mill effluents. There's no assurance of any return for their investments of almost $300,000 annually.

The locations of these projects and studies, as marked on the map and described in accompanying artcle, are:

1. **University of Washington.**
2. **Texas A. & M.**
3. **Louisiana State University.**
4. **Flambeau River Project.**
5. **Appleton—Trickling filter.**
6. **Appleton—Kraft wastes.**
7. **Kalamazoo College.**
8. **University of Michigan.**
9. **Purdue University.**
10. **Unversity of Alabama.**
11. **McGill University.**
12. **Mellon Institute.**
13. **Manhattan College.**
14. **Rutgers University.**

Wisconsin sulfite mills and the organization of sulfite mills in the State of Washington. No organization, either within or outside the paper industry had, however, attempted the problem including both disposal and utilization of all types of waste, on a national basis, with the inevitable complication bound to arise when the problems of several hundred mills with their variety of wastes in 35 states and 7 regions are involved.

The present officers elected at the annual meeting of members in 1944 are George E. Dyke, chairman of the board of governors, U. M. Dickey and George W. Mabee, vice chairmen; J. D. Zink, treasurer, and Russel L. Winget, executive secretary.

At the present time the council's membership represents roughly 80% of the total pulp, paper and paperboard production of the United States. The council will operate during 1946 on a budget of approximately $140,000, all of which, with the exception of minimum overhead and executive office personnel expense, wil be spent for research.

After approximately a year and a half of active functioning the council has organized a sound research program. Standing regional committees have been organized in each of the seven regions of the United States. These committees meet twice a year and based on information obtained through distribution of questionnaires and from personal knowledge of the committee members the urgent problems in the region are presented for consideration in open meeting. Such presentation generally results in a recommendation to the Board of Governors and in the establishment of a research program at some qualified institution contiguous to the area in which the particular problem is concentrated.

Council's Research Projects

As a result of the recommendations of the regional committees, a number of separate research investigations are now under way. These include the following projects, most of which are now fully organized and on which the laboratory and field work are progressing rapidly.

1. The council has established a multiple fellowship at the Mellon Institute of Industrial Research at Pittsburgh, to investigate all phases of the industry's waste abatement and utilization problems that are suitable for laboratory investigation. Prof. W. W. Hodge, formerly head of the chemical engineering department of the University, is in charge of the work.

2. At Manhattan College, Prof. Clarence Velz, head of the civil engineering department, is making a sanitary analysis of all the watersheds of the United States, in which the pulp and paper industry is situated. The purpose of the survey is to determine the industry's responsibility for existing stream conditions in relation to other industries and municipalities and also to determine the degree of treatment the pulp and paper industry's wastes must receive to be rendered acceptable for discharge into the stream.

3. At the Institute of Paper Chemistry, Dr. Willis Van Horn is directing a National Council project known as the Aquatic Biology Project. The purpose of this investigation is to investigate the effect of pulp and paper mill wastes on aquatic life. This project has a background of several years' work on the effect of kraft mill waste on aquatic life.

4. and 5. The council has undertaken two projects in connection with waste sulfite liquor disposal. These are the trickling filter and river aeration projects previously mentioned as having been initiated by Wisconsin mills.

6. At Purdue University, under the direction of Prof. Don E. Bloodgood of the School of Sanitary Engineering, the council has established a fellowship to determine the best method of disposing of straw mill waste liquor with due regard to recoverable materials.

7. The council has just concluded an agreement with Rutgers University in New Jersey under the terms of which the college will make basic plant and laboratory studies of fundamental factors involved in white water treatment at board and fine paper mills. The work is under the direction of Dr. William Rudolfs, who, in addition to being chief of the division of sanitation of Rutgers University, is a national authority in the field of stream sanitation. This project will, as will all other projects, be closely integrated with actual mill operations so that the research findings can be made applicable to full-scale plant operations.

8. The School of Engineering Research of the University of Michigan is cooperating with the council in its study of deinking mill wastes to determine the best way of treating and utilizing such wastes, under the terms of an agreement signed in 1945. Professor McCready and Dr. Ridenour of the chemical engineering and sanitary engineering departments, respectively, are drecting this activity. Kalamazoo College of Kalamazoo, Mich., is also cooperating in this project by leasing to the council its laboratory facilities and making students in its chemical engineering department available for part-time work. Phillip Morgan, a sanitary engineer employed by Mellon Institute, is resident engineer in charge of the deinking investigation.

9. Regarding the research at the University of Washington, the council has maintained a close relationship with it and as this issue went to press, plans were being formed to set up a National Council research program on the Pacific Coast. Several institutions are on the prospect list, including notably Oregon State College.

10. The council recently established at Louisiana State University at Baton Rouge, La., a research project in connection with the Southern kraft industry's pollution problems. This project will be coordinated with the previously mentioned kraft mill project at Appleton, Wis., and other projects on kraft mill pollution problems at the University of Alabama and Texas A. & M. College.

Six States Consider Laws

The interest of state legislators in stream pollution legislation is evidenced by the fact that of the nine states having 1946 legislative sessions, stream pollution legislation has been introduced in six. These include Virginia, South Carolina, Mississippi, Rhode Island, New York and Massachusetts.

The Mississippi bill includes several unusual features embodying modern concepts of stream sanitation, one such feature being the provision that the certificate of compliance issued by the Fish and Game Commission "shall be conclusive evidence for all purposes that the effluent discharged . . . does not result in pollution that will tend to destroy fish or other aquatic life . . . or be injurious to the public health or against the public welfare."

It might be a tip to mills in the states where these bills are now being considered that in some other states already having laws, the industry fought for and obtained provisions which gave them final recourse in courts of law. In other words, they insisted that political agencies should not have the final word in any punitive action against a mill, but that the right of review before a duly constituted court be allowed. There have been other provisions in state laws which have protected rights of mills.

Paper Industry Issues "Orders"

IN this day and age it is not unusual for one industry to take benevolent dictation from another industry. But for the first time since the U. S. was very young, publishers are letting paper companies tell them how far they may go in 1946 and 1947.

It's too early yet to know if book sales will reach the astronomical heights of 1945. But this is already certain: There will be at least three times as many titles issued!

Publishing, a big industry, is literally gasping for paper.

About 200 new magazines are listed for first production during 1946.

The Time-Life group and Curtis publications including the Post expect record circulations and have acquired mills of their own to assure their supply.

Saturday Review of Literature, once a faltering book review sheet, is running 60,000 and still going. *Foreign Service,* the official organ for Veterans of Foreign Wars, is raising its advertising rates on the basis of 1,000,000 readers. To show how widely the interest ranges—*Sports Afield* now has half a million readers, *Popular Science* a million.

Among the new ones are *Travel and Camera* (150,000); *World Report,* David Lawrence's new weekly; *Predictions by Experts; Picture News*—a mass circulation idea based on comic strip technique; and Fawcett's *Best Detective Cases.* Rushing in breathlessly with 400,000 initial copies is *Lovers: a Magazne of Enchantment!* And there is a new pocket size digest of current novels called *Bestsellers* with a starting run of 200,000.

An expert in the magazine field says, "If ten per cent of the new planned magazines are born, entirely undiscovered paper and printing sources will have to be found."

His words may be truer than most of us realize.

Salesmen - - Take a Bow

ONE of the groups increasingly taken into account in any complete picture of the paper industry is the Salesmen's Association which now numbers about 375 members.

It has many notable achievements to its credit. In 1923 it sponsored the formation of the Import Committee to protect the industry against imports of undervalued and mis-classified papers.

In recent years it has actively promoted proposals for a public relations program—and this year sees the idea bearing eatable fruit.

"The importance of paper in daily life" is what the salesmen—who are on the firing line for the industry—want to see stressed.

SALIENT FACTS ABOUT PULP AND PAPER INDUSTRY

Six hundred and five companies operate 842 primary paper mills and 371 pulp mills in the United States, Canada and Newfoundland (current data for all countries). An additional 103 primary mills are in Latin America, from the Rio Grande to Terra del Fuego.

The products of the pulp and paper mills of the United States have been estimated by association officials at around $2,000,000,000 per year. Products of the Canada-Newfoundland industry run over one-third of a billion dollars.

The primary mills in the United States represented an investment in 1945 of $2,930,000,000. Investment in Canada-Newfoundland is about two-thirds of a billion dollars.

The U. S. industry paid wages of $331,000,000 to 142,000 persons in 1945. North of the international line are another 38,000 employes. An interesting sidelight is that 400,000 more in the U. S. are employed in printing and publishing, which is dependent on the paper industry.

Pulp and paper is the No. 1 industry of Canada. In the U. S. it was rated No. 6 in government data of 1939.

U. S. PULP AND PAPER INDUSTRY STATISTICS

	1945	1944
Total Investment	$2,930,000,000	$2,880,000,000
Total wages paid	$331,000,000	$329,000,000
Number of employes	142,000	147,000
Investment per employe	$20,633	$19,560
Number of companies	517	522
Number of paper mills	744	723
Number of pulp mills	242	249
No. of idle mills	10	18
Value of products	$2,000,000,000 (estimated)	

Principal Statistics of Canadian Pulp and Paper Industry (1944 is the latest available)

Year	Establishments	Capital	Employees	Salaries and Wages	Fuel and electricity used	Materials and supplies used	Gross Value of products
	No.	$	No.	$	$	$	$
1919	99	275,767,364	26,647	32,264,208	12,503,197	54,084,801	137,912,502
1920	100	347,553,333	31,298	45,253,893	16,989,356	84,208,788	236,420,176
1921	100	379,812,751	24,619	34,199,090	14,961,741	62,276,224	151,003,165
1922	104	381,006,324	25,830	32,918,955	13,000,002	64,692,722	158,950,956
1923	110	417,611,678	29,234	38,382,845	18,421,804	71,322,722	184,821,511
1924	115	459,457,696	27,627	37,649,528	17,396,375	72,233,876	179,259,504
1925	114	460,397,772	28,031	38,560,905	17,506,735	76,514,990	193,092,937
1926	115	501,184,714	31,279	44,175,502	20,424,405	85,365,465	215,370,274
1927	114	579,853,552	32,876	45,674,293	24,024,319	84,813,080	219,329,753
1928	110	685,687,459	33,614	47,322,648	24,546,957	88,490,421	233,077,236
1929	108	644,773,806	34,202	50,214,445	25,356,090	96,874,749	243,970,761
1930	109	703,937,104	33,207	45,774,976	26,158,260	81,992,255	215,674,246
1931	103	630,176,540	26,669	34,792,013	22,927,919	63,947,678	174,733,954
1932	98	597,550,013	24,561	28,348,128	19,821,839	48,970,967	135,648,729
1933	95	559,265,544	24,037	26,657,542	18,902,330	47,632,521	123,415,492
1934	95	554,973,891	26,993	33,307,043	21,977,913	53,426,534	152,647,756
1935	95	545,572,938	27,836	35,893,313	22,682,883	57,995,037	159,325,546
1936	93	536,073,034	29,478	39,440,074	25,690,606	72,202,983	183,632,995
1937	98	570,352,287	33,205	48,757,795	29,121,065	91,121,629	226,244,711
1938	99	594,908,222	30,943	42,619,311	23,800,737	71,062,580	183,897,503
1939	100	597,908,918	31,016	44,737,379	25,094,978	79,933,657	208,152,295
1940	103	642,979,942	34,719	56,073,812	31,045,406	108,758,862	298,034,843
1941	106	678,937,841	37,154	63,677,818	34,437,122	125,437,012	334,726,175
1942	105	655,598,196	38,002	69,656,393	36,226,420	135,970,437	336,697,277
1943	106	667,458,143	37,020	71,199,422	36,211,064	143,956,462	345,653,470
1944	104	*	37,896	75,833,408	37,358,842	157,995,141	369,846,086

*Statistics on capital not collected in 1944.

CANADIAN INDUSTRY STATISTICS FOR 1944

(Latest Available)

		Canada	Quebec	Ontario	British Columbia	Other Provinces
Establishments:						
Pulp mills	No.	104	46	38	7	13
Pulp and paper mills	No.	27	10	7	3	7
Paper mills	No.	50	26	15	3	6
Capital employed		*				
Total employees	No.	37,896	18,910	10,864	3,901	4,221
Salaries and wages	$	75,833,408	36,894,543	22,266,590	8,411,434	8,260,841
Fuel used	$	21,628,321	10,459,448	5,853,032	2,188,841	3,127,000
Electricity purchased	$	15,730,521	10,167,532	3,431,213	68,606	2,063,170
Power employed	H.P.	1,990,807	1,042,298	569,714	146,673	232,122
Pulp-making materials and supplies	$	122,160,859	62,140,335	31,496,223	10,316,678	18,207,623
Pulp made	$	211,041,412	105,043,991	54,934,993	19,739,476	31,323,952
Paper-making materials and supplies	$	133,530,433	69,728,771	41,812,281	8,124,057	13,865,324
Paper made	$	255,545,841	134,617,241	77,239,367	19,088,145	24,601,088
Total value of materials, supplies	$	157,995,141	78,495,020	47,148,136	12,338,145	20,013,840
Gross value of products	$	369,846,086	186,918,517	106,197,694	32,726,647	44,003,228
Net value of products	$	174,492,103	87,796,517	49,765,313	18,131,055	18,799,218

*Not available for 1944. Source: Dept. of Trade and Commerce, Dominion Bureau of Statistics.

3-year program provides for an increase of 2,193,000 tons of paper and 1,731,000 tons of pulp in United States and Canada.

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Expansion is a subject which is on everyone's lips and in everyone's minds in the pulp and paper industry today. It is an intriguing subject. It is an important one, too, because existing as well as proposed new companies cannot intelligently plan their business for the next few years unless they know something about plans of others in their field . . . how much pulp or paper will be thrown on the market in which they hope to do business.

In an effort to assist these companies by giving them a broad picture of the modernization and expansion program in all regions of the North American continent, the field staff of PULP & PAPER INDUSTRY has made an over-all survey of that program for the next two or three years.

This survey indicates that in the next three years 1,731,000 tons of pulp will be added to the annual producing capacity of the United States and Canada, which was about 16,500,000 tons as of last Jan. 1 (actual 1945 production was 15,600,000 tons for U. S.-Canada). This additional production will be overwhelmingly in sulfate pulps and there will be a tremendous expansion in bleaching of pulps.

As for paper production, the survey indicates expansion programmed for an additional 2,193,000 tons annually in the United States and Canada, which compares with existing capacity last Jan. 1 of more than 24,000,000 tons (1945 production was about 22,000,000). The paper expansion is almost entirely scheduled for U. S. mills—their total being 2,136,000 tons (which compares with production of 17,374,208 tons in 1945 and actual machine capacity of 19,360,000 tons on Jan. 1, 1946).

In the face of this program, which calls for at least 40 new or rebuilt paper machines and pulp driers and extensive construction work, the big question marks are these (1) Where's the additional pulp going to come from for the greater paper expansion, and (2) where's the woods labor and wood going to come from to make the pulp. Those two questions are discussed in later chapters in this issue of the North American Review Number (pulp, page 84, and pulpwood, page 110). They are not easy questions to answer, but they are not hopeless questions, either.

Millions of Dollars to Be Spent

We might make an estimate of the dollars and cents cost of this program, but that could only be conjecture. Today the investment required in a new mill may range from six to 16 million dollars; in Ontario alone, a scene of tremendous development, the investment by a number of companies is estimated at about $80,000,000. For the entire continent, several hundred million dollars will be spent on equipment and construction.

During this year alone, 27 new paper machines will be delivered—it is hoped. Five of these are for book paper, five for paperboard and nine for tissue.

In annual production figures — more value than day/tons to some companies—here are the results of PULP & PAPER INDUSTRY's survey of expansion plans for 1946-48:

Expansion in Pulp	*Annual Tonnage*
U. S.-Canada	1,731,000
United States	1,248,000
Canada	483,000
South (U. S.)	736,500
Pacific Coast (U.S.-Canda)	402,000
Midwest and East (U. S.)	264,000
Ontario-Quebec	328,500

(Present annual pulp production capacity in the South is 5,076,000 tons; in Midwest and East U. S., 4,000,000 tons and on the Pacific Coast (U. S. and Canada, 2,600,000 tons.)

Expansion in Paper	*Annual Tonnage*
U. S.-Canada	2,193,000
United States	2,136,000
U. S. (1946 only)	*1,062,000
The South	957,000
Pacific Coast (U.S.-Canda)	379,500
Midwest and East (U. S.	808,500

*These are American Paper & Pulp Assn. figures for 1946 only, including output of both new and improved machines for paper but only new machines on paperboard. APPA estimates that if same ratio prevailed in paperboard for output of improved or rebuilt machines, as in paper, this estimate shoud be increased by at least 280,000 tons.

We are indebted to many companies which gave our staff of editors confidential information regarding their proposed expansion in order that we could obtain total figures for regions or states. In the three maps accompanying this article the break-down for states or combinations of states and Canadian provinces is shown in anticipated daily increased tonnages. X's mark location on these maps where some expansion is planned, but we hasten to warn that all expansion sites are not marked because, some have not been publicly announced.

Less than half of these projects will be completed in 1946 or early 1947. The remainder may not be in production until late 1947 or 1948.

Figures Are Conservative

Our survey indicates that the figures we have gathered together are probably on the conservative side. We may have included some projects which will fold up like the proverbial house of cards before ever a pile is driven or load of dirt moved. It will take a year to three years to get many paper machines or other equipment on order today and between now and the time draughtsmen start working on some projects, conditions may alter and wipe them out. We wouldn't be surprised if some companies decide to alter their plans on the basis of this survey.

However, there are not many of the projects included in our calculations which could be entirely abandoned now. The purely ethereal programs—those just in "talking stage"—we left out, unless there was considerable assurance they would be carried out. In some states or provinces of Canada, we were not able to do a really complete job because of lack of response to our inquiries or for other reason, so very likely the projects we missed altogether will more than offset the

PROJECTED EXPANSION IN PULP AND PAPER IN EASTERN U. S.—CANADA

Proposed Additional Daily Output in Tons When Expansion Plans Are Completed

Some of the information gathered by this magazine as basis for this map was confidential. Totals for some states have been combined on the map, in order not to inadvertently disclose confidential data about particular mills. Caution—the X's show only sites of mill expansion which have been announced. Therefore, the total figures for certain states or groups of states may include expansion at mills which are not shown. In even some announced projects, the actual tonnage figures are confidential.

On this map is shown proposed expansion of 4,230 tons of pulp per day and 6,045 tons of paper per day. We discuss these plans in more detail—to the limited extent to which we have authorization—in the accompanying article. It will be noted that proposed expansion in Southern States totals 2,255 tons of pulp and 3,190 tons of paper.

Other maps show additional plans for expansion on Pacific Coast.

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This map and information shown on it is copyrighted by PULP & PAPER INDUSTRY

PRODUCTION EXPANSION IN WESTERN U. S.

Proposed Additional Daily Output in Tons When Expansion Plans Are Completed

Almost the entire pulp expansion shown by these figures will be sulfate. Washington State is already the biggest pulp producing state in the United States with daily capacity of slightly over 5,000 tons. The additional 525 tons of pulp shown on this map will put that state far ahead of all rivals.

Paper production also will be much greater. This ranges from facial tissue in three mills to book paper in Oregon and with various kinds of sulfate papers and paperboard elsewhere.

These new projects, if all carried out, will increase paper production in the four states by 1,235 tons per day. Their present capacity totals about 5,500 tons per day.

The expansion programs, except for one in California and perhaps one major one in Washington, will be completed in one year to 18 months. Entirely new mills noted in this map are the projected sulfate mill of Weyerhaeuser Timber Co., the board mill of Simpson Logging Co. at Shelton, Wash., the Idaho-Montana Pulp & Paper Co. at Polson, Mont., and two projected in California, not yet officially announced. Other indicated expansion will be at existing mills.

These projects, in four states, will call for at least 10 new machines, two others entirely rebuilt and a number of others speeded up.

few that may be abandoned.

"Talking stage" mills in the South may eventually add 150,000 tons a year to our present figures.

It may be noted at this point that an independent survey in the U. S. alone, made by the American Paper and Pulp Association and the Writing Paper Manufacturers Association estimates a total daily paper tonnage increase during 1946 of 3,427 tons. This may be compared with our figure for an approximate three-year period, 1946-47-48, of 7,120 tons. Statistics gathered in the association survey are also published on these pages.

Our figures may well be on the conservative side as one association executive, who has likewise been making investigations, says that his data for just two years—1946 and 1947—indicates plans for an additional capacity in U. S. alone for papermaking of about 3,000,000 tons, to be in operation by Jan. 1, 1948.

However, D. K. Brown, who ended two years in February as president of the American Paper & Pulp Association, said:

"A study of new machines scheduled for installation during the coming year together with rebuilding of existing machines shows that while the increased capacity of individual companies may be fairly large yet the over-all increase is only a small percentage of present production in any group, probably not more than the growth of our population during the war period."

The expansion now under way will provide the most rapidly achieved and biggest increases in paper machine capacity in history, except for the year 1940. In that year the paper industry was just getting started in modernizing equipment after the depression. In papermaking, it takes time to effect such changes and a million-dollar paper machine requires many months to build. A 1,632,000-ton increase in capacity was effected in 1940, but lend-lease and war interrupted the program so today, as pointed out by Allan Hyer, former WPB paper industry equipment dis-

tribution chief (now Black-Clawton vice president), the mills really have about 15 years' modernization to catch up on—dating back to before the depression.

Potential future U. S. paper machine capacities mentioned above compare with capacities of 19,360,000 tons in 1945, 19,260,000 tons in 1944, 18,522,000 in 1941, which was a substantial increase over 16,890,970 in 1940, 13,728,040 in 1933, and 7,250,000 in 1917. These figures are from the Writing Paper Manufacturers' Association.

Expansion in South

Proposed expansion in the South of U. S. seems to have aroused the greatest rivalry and interest because of many factors involved. While there are a few mills now in the South which eat up 2,000-2,500 cords of wood per day, in some instances in highly competitive areas and probably more than they are now reproducing, the overall picture is not at all discouraging. Experts believe the South has only begun to exploit its wood-growing possibilities and a little more fire protection, for one thing, could make a tremendous change for better yield. Possibilities for improved kraft papers for almost any purpose has also tended to keep most plants in the South in dark secrecy.

This magazine's survey shows plans for an additional 2,455 tons of pulp and 3,190 tons of paper in daily capacities of new and expanded mills south of the Potomac River. These figures include confidential data which would not permit us to mark some sites of mills on the map on these pages.

All new production will be derived from the sulfate process except for 215 tons groundwood. In connection with this, it is interesting to note that the Champion Paper and Fibre Co. is in process of converting its Canton, N. C., mill from sulfite to sulfate. As a result of the reconversion program the company at this plant will increase pulp production by 50 tons per day and paper and board by 120 tons. A third Fourdrinier machine will be added. The change in process will make it possible for the company to use Southern hardwoods in conjunction with pine, a movement which has been increasing steadily during the past few years. Another feature in the change in the Southern field will be the marked increase in bleaching.

Regarding new Southern mills, the most recent announcement was that by Roy Ferguson, president of St. Regis Paper Co., that his company will build a new kraft paper mill "somewhere in the South" at a cost of $10,000,000, which will be ready to produce in 1948 and will employ 200. He said the company will increase products of all its plants by 30% in 1946 over the previous five-year average. The Southern mill-to-be is not entered in our figures, nor is one other big mill talked about for Florida. It is likely our figures for the South eventually will be increased 400-500 tons per day.

Florida Pulp & Paper Co. has also announced a new paper plant, probably of about 200 tons daily, to be built near the present mill at Pensacola (Cantonment), Fla., at a cost of $7,000,000. The present plant, undergoing expansion for several months, will have present pulp and paper capacities doubled to about 200 tons each.

Other new mills which have been definitely announced or are in process of construction include the Hudson Pulp & Paper Co.'s Southern Division unit at Palatka, Fla., to make 150 tons of pulp and paper a day; The Mead Corp.'s subsidiary, Macon Kraft Corp., at Macon, Ga.; the Southern Paperboard Corp., Robert Gair, Inc.'s subsidiary, at Savannah, Ga. (450 tons); and the Coosa River Newsprint Co. mill at Childersburg, Ala. (200 tons per day).

Other mills in the talked-of stage include a possible $4,000,000 plant in North Carolina, where timber areas are reserved for this purpose by one of the biggest companies; two mills in the Georgia-Florida area, and possibly another unit in Louisiana or Mississippi, but these are not counted in our calculations.

Other notable increases in paper and paperboard production through the installation of new machines on the South Atlantic Coast, include those of Container Corp. of America at Fernandina, Fla. (190 tons per day of board); Union Bag & Paper Corp. at Savannah (200 tons more pulp and one new machine will produce 160 tons of paper); and West Virginia Pulp & Paper Co., Charleston, S. C. (new paper machine). The North Carolina Pulp Co. also is expanding.

At Georgetown, S. C., Southern Kraft Division of International is building a new hardwood pulp mill to feed existing paper machines. And at Mobile, Ala., Southern Kraft is stepping up production 75 tons a day.

Southland Paper Mills is adding a newsprint machine to double its production of 170 tons a day of paper, but will utilize pulp it has marketed. The newly acquired and very extensive facilities for Kimberly-Clark tissue and cellulose

EXPANSION IN BRITISH COLUMBIA

Proposed Additional Daily Output in Tons

The above figures are for production over and above existing daily capacities totaling about 2,000 tons of pulp and about 1,200 tons of paper.

Even figures shown on the map might be greatly increased in a few years. The Canadian province is one of the likeliest spots for extensive expansion on the continent.

Pulp expansion figures include 235 tons of sulfite (the only projected expansion in sulfite on the continent except for 200 tons in Quebec and New York); 35 tons at Pacific Mills, Ocean Falls, and 200 tons at the proposed new mill at Giscome, near Prince George, projected by W. B. Milner and associates. The rest is almost entirely in sulfate, and includes the projected 165-ton Bloedel, Stewart & Welch mill at Port Alberni, Vancouver Island, and announced expansion at Sorg and Pacific Mills.

Westminster Paper Co. is going to double its paper output and paper production may be increased beyond the figures shown in map, when some of the bigger companies complete improvements.

(This map and information shown on it is copyrighted by PULP & PAPER INDUSTRY magazine.)

RESULTS OF PULP & PAPER INDUSTRY'S SURVEY OF EXPANSION—1946-1947-1948

Daily Capacity in Tons

(annual production figures are listed in accompanying article)

	Pulp		Paper	
	Present	*Additional*	*Present*	*Additional*
U. S.-Canada	55,000	5,770	80,000	7,310
U. S. Only	36,700	4,160	64,533	7,120
Canada	18,300	1,610	16,450	190
South (U. S.)	14,225	2,455	19,000	3,190
Pac. Coast (U. S.-Can.)	8,710	1,340	6,472	1,265
Midwest-East (U. S.)	13,300	880	40,000	2,695
Ontario-Quebec	12,000	1,095	13,000	160

Note: Present capacity figures include actual available data or approximations (where round numbers are used).

wadding products at Memphis will be an important addition in the South economically but does not count up much in tonnage. Henry Kaiser is eyeing a site for paperboard at Evadale, Texas.

In considering the pulpwood supply situation it must not be overlooked that wallboard and insulation board manufacturers furnish competition in this field, and they have big plans for expansion. There are at present ten construction board mills, either built or building, in the area from Florida to Texas, and pulp produced in four of these exceeds 1,000 tons per day. Armstrong Cork Co., which is building a mill at Macon, Ga., to add to its productive capacity in existence at Pensacola, is experimenting with pulpwood. While U. S. Gypsum at Greenville, Miss., uses fast-growing Mississippi River sandbar cottonwood and willow, two species that in the past were not considered as a source of supply for the paper mills, technical advances in pulping have brought, and are bringing, hardwoods generally into the field of utilization of the major industry. Celotex, which uses cane, and Flintkote are expanding, also, in this board field.

Expansion in Midwest and East U.S.

Expansion in the Middle West and Northeast United States has developed several interesting trends of importance. Here where spruce stands are becoming much thinner, there has been a turning to hardwoods and development of new sulfate cooking processes of superior technique to use these hardwoods. The groundwood process is also going to figure in this picture, with considerable augmented bleaching.

In papermaking, perhaps the three most important trends in expansion are (1) increased number of new or converted book paper machines, accompanied by machine coating, (2) efforts being made to capitalize on wartime developed popularity of tissue, with several machines ordered for this purpose, and (3) increases in paperboard manufacture to meet the wartime spurt given to paper packaging technique.

Brown Co., manufacturers of high alpha pulp at Berlin, N. H., has developed its variation of the sulfate process for a new sulfate mill at that location, manufacturing 200 tons a day. This gives new wealth and value to New England stands of birch, beech and maple, which will be utilized. Brown Co. also will have a new high speed toweling paper machine and make other improvements in its operations.

St. Regis Paper Co. is, as Mr. Ferguson told stockholders, expanding its output 30% and this will affect its concentration of mills in Northern New York, especially. Here, too, hardwoods will be made use of, and groundwood bleaching and other techniques will supplant old systems. A new high speed machine is being installed at Deferiet, and provision is made for other additions when desired.

St. Regis has purchased mills in Minnesota and Massachusetts — Watab and Nashua River — and there is every reason to expect some of its improvements will be made at these mills, although they were not specifically included in the expansion program.

Time, Inc., has bought the Bryant mill in Michigan, Maine Seaboard in Maine and Hennepin in Minnesota, and Cuneo Press has acquired Combined Locks mill in Wisconsin and in every case these actions have been for the purpose of getting better and more production. At Bryant, for example, power potentialities have been expanded and work is being done on paper machines.

Consolidated Water Power & Paper Co. in Wisconsin is going to be one of the first companies to complete its expansion with one new paper machine added at its Biron mill and two news machines at its recently purchased Wisconsin River division converted to machine coated paper. All of this will probably increase Consolidated's output of machine coated paper, already considerable, by somewhere near 50%.

Curtis Publishing Co. has acquired New York & Pennsylvania Co.'s output and is doubling capacity at Lock Haven, Penn., with addition of a new machine producing about 125 tons a day.

Kimberly-Clark's expansion in the South and Canada has already been discussed, but its program already under way close to the home base in Neenah, Wis., is important, too. This calls for two high-speed, high-production coated book paper machines at the Niagara, Wis., division and also a new creped wadding machine at Lakeview division.

International Paper Co., like Crown Zellerbach in the West, is putting in the Consolidated process for coated book paper at its Palmer, N. Y., mill. More bleached groundwood paper will be made by this company.

Minnesota & Ontario Paper Co. has added an Insulite board machine, adding 40% to its production of this board, and it is projecting two coating machines and adding plants for bleaching of kraft and groundwood pulps. Except for Insulite, its overall production may not be materially increased but its utilization of wood resources will be much improved and its products will be in higher grades.

Northwest Paper Co., Rhinelander Paper Co., Nekoosa-Edwards Paper Co., Thilmany Pulp & Paper Co., are making various improvements, including bleach plants at Northwest and Nekoosa, all of which may not greatly increase production but will all aim toward more efficiency.

Blandin Paper Co., in Minnesota, one of the mills shifting from news to higher grades of paper, is to increase its groundwood pulp output and add a new machine. Marathon will expand its program in Wisconsin, especially after its own pulp supply is being produced in Canada.

In Kalamazoo, Sutherland Paper Co., is increasing its paperboard production by 50 tons per day and making improvements and expanding in its conversion plant. Michigan Carton Co. is adding a board machine to produce about 75 tons per day. Speed-ups at Watervliet,

Michigan Paper and other mills should add somewhat to output in Michigan, and KVP, of course, will have its own pulp mill in Canada to draw upon for any new production.

Hammermill Paper Co. is adding a paper machine and has an extensive postwar program. Sorg Paper Co. is increasing power resources to put it in a strong position for bigger markets.

One of the big expansion programs in the East was being completed this year at Fort Edwards, N. Y., where Scott Paper Co. bought a long idle International mill. Two paper machines were put into operation there in December and January and already toweling is being manufactured. Two more new paper machines for this mill will be installed by this summer.

Another important eastern development is the Berst-Forster-Dixfield Co. program in putting back into the field an old mill at Ogsdenburg, N. Y. B-F-D's plan was to produce 210 tons of pulp including sulfite for the Plattsburg mill but paper machines are projected for Ogdensburg, too, and will make about 100 tons of towel and tissue daily.

Dexter Sulfite Pulp & Paper Co., of Dexter, N. Y., is adding a machine to make a small quantity of glassine and greaseproof and several other mills in that field have plans to expand to meet their better market.

Four new Fourdrinier machines and one new cylinder machine are being made for mills in New England.

Considerable expansion in several grades is due in the New York, Pennsylvania and New Jersey areas. Among them are the $2,000,000 expansion of Continental - Diamond Fibre Co., Bridgeport; a new paper machine for Eastman Kodak Co. at Rochester; modernization of two machines at P. H. Glatfelter Co., Spring Grove., Pa.; a new Fourdrinier at Johnson & Johnson's mill for tissue, New Brunswick, N. J.; a new paperboard machine in a $2,500,000 program at National Gypsum Co., Buffalo; the Cornwall Paper Co. in Orange, N. J., is adding 75 tons daily and a new paperboard mill is to rise on premises of Gibraltar Corrugated Paper Co., in North Bergen, N. J., to be producing this summer. Personal Products also plans increased tissue production at an Illinois plant.

As an example of the promotion methods coming up in the tissue industry, an announcement last month by Personal Products, a Johnson & Johnson subsidiary, is of interest. Its new mill at Milltown, N. J., is installing two new machines and begins distribution of a new single-fold cleansing tissue called "Yes." The tissue will be 8¼ by 10 inches and the company claims its package to be "the first new packaging development in years in the tissue industry." It is about the size of a two-pound candy box, is only three inches deep for easy storage. The opening is extra large, and the package is the result of a survey. The introduction of "YES" and the claims made for it is significant as to what may be in store, competitive-wise, in the tissue industry of the immediate future.

Small perhaps, but quite numerous are the programs for expansion in many eastern seaboard mills. We, unfortunately, were not permitted to list some of them, but their figures could be used in our overall calculations. It looks like big years ahead for the industry and the companies which will equip them with machines and auxiliary equipment. For every machine of a million dollar cost, the auxiliary equipments are at least that much again and sometimes twice that amount. It all adds up to increased and steady employment for many thousands.

AMERICAN PAPER & PULP ASSOCIATION'S SURVEY OF U. S. PAPER EXPANSION IN 1946

Tons of Daily Capacity

Grades	*Mills Surveyed*		*Industry Wide*	
	Jan. 1, 1945 Capacity	*Rebuilt Increases in 1946*	*Estimated Rebuilt Increases*	*New Machine Increases*	*Total Est. Industtry Increases*
Book	3,755	251	389	350	739
Groundwood	1,760	95	114	.....	114
Kraft Paper	2,838	.....	.....	450	450
Tissue Paper	998	67	228	233	461
Writing Paper	1,370	56	140	98	238
Specialty Paper	1,394	35	35	35	70
Sulphite and Glassine	.....	.....	.....	30	30
Kraft Board	.....	.....	.....	1,100	1,100
Other Board	.....	.....	.....	125	125
Roofing Paper	.....	.....	.....	100	100
TOTALS	.....	.....	906	2,521	3,427

Pacific Coast

Here is another outstanding area of expansion. Already announced programs, plus those which we have been confidentially assured are going through, will add 1,340 tons to pulp output and 1,265 to paper. The pulp production is almost entirely in sulfate, with only one mill in interior British Columbia proposing to produce sulfite, which has been the traditional and choice market pulp of this area for many years.

The projects on the United States side of the coastal highway Peace Arch include extensive expansion by Crown Zellerbach Corp. and Weyerhaeuser Timber Co.

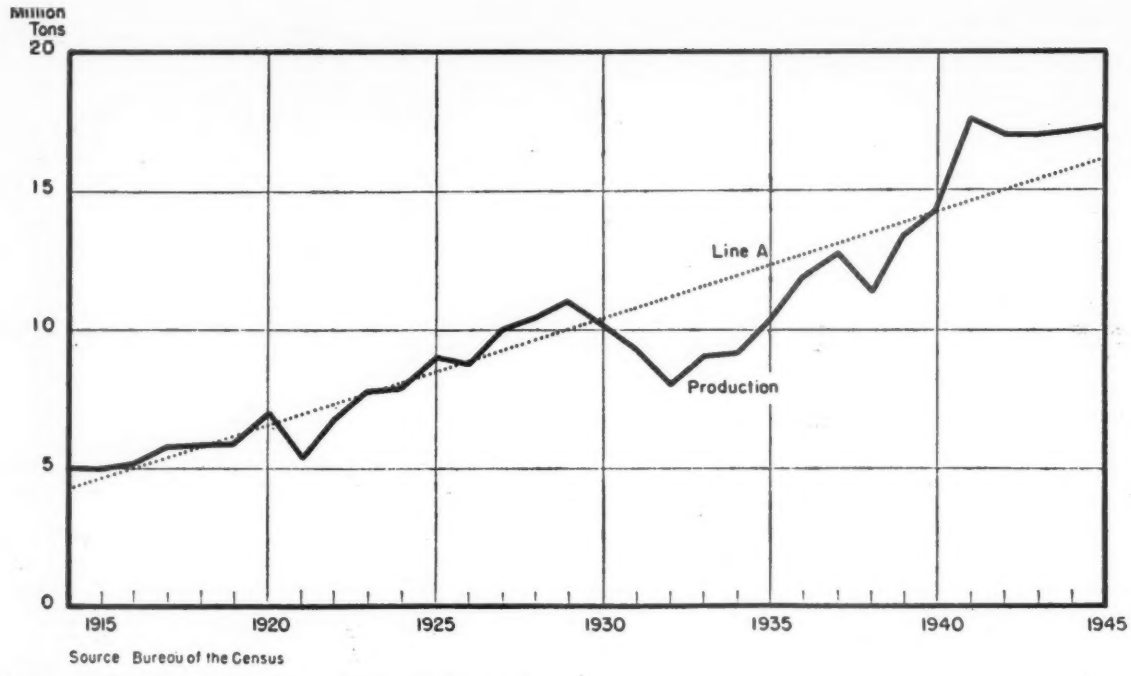
The former's West Linn, Ore., mill is adding one new machine and rebuilding an old machine for machine coated paper to supply Time, Inc., and Curtis Publishing Co. Two A2 printing and phone directory machines and one toweling machine at West Linn are being speeded up. At Camas, Wash., Crown Z will have two new machines, one for facial tissue and one an ultra-modern specialty all purpose machine. Tonnage-wise, capacities of these two big mills will be increased from present 800 to 1,000 tons a day—slightly more if magazines return to heavier paper as expected.

In other Crown Z mills, there will be some slight stepping up. There will be considerable expansion in bleaching and in the installation of hydraulic log barkers.

Weyerhaeuser Timber Co. is pushing along a program for a new sulfate mill and a new magnesia base recovery system for its sulfite mill at Longview, Wash., having installed the second big log barker for its mills there. The kraft pulp mill will produce 200 tons daily. Weyerhaeuser's extensive wood operations in the West are being expanded in several localities and because of this company's well known full utilization policies, there seems every certainty that its pulp facilities will expand along with its other wood conversion units.

An outstanding addition this year to the western pulp and paper industry is the very progressive Simpson Logging Co., one of the big operators of the West. It is starting in a small way with work already begun on a 50-ton insulating board mill which is in reality, a big "pilot" plant.

The Idaho-Montana Pulp & Paper



LONG TERM TREND IN U. S. PAPER PRODUCTION

In this chart the long term, steady growth of the U. S. paper industry is clearly shown. The long term trend is Line A and reflects increased population and per capita consumption. According to the American Paper and Pulp Assn., this line shows an overall average annual growth of 386,700 tons from 1914 to 1945. This is 5.15 index points annually if 1914 production is taken as 100. The actual production line shows the dips of depression periods and also periods of higher production. The extension of Line A, however, would still be considerably under the actual rate of production this year and probable in 1947. But then what?

Co. plans to start work this summer on the first mill in Montana—at Polson—to make 150 tons daily of kraft pulp and paper.

Two new mills, not yet officially announced, are projected in California. Ten new machines are called for in the projects now under way on the western slope of the U. S.

The Rayonier mills are carrying out what they call a "balancing" program of improvements and have instituted a unique ammonia base cooking process for the sulfite mill at Shelton, Wash.

The St. Regis Paper Co. has announced it eventually will make paper at its 300-ton kraft pulp mill in Tacoma. Standard Carton Co., in Tacoma, has acquired a cylinder machine to eventually make 64 tons a day. At Bellingham, Wash., the replacement of a cylinder wet end with a Fourdrinier for dry creped tissue will increase output from 21 to 30 tons.

A million dollar expansion and modernization program at the Antioch, Calif., division of Fibreboard Products, Inc., calls for new production equipment and increased efficiency. Container converting plant and carton plant are being enlarged.

At the Stockton, Calif., Fibreboard plant, a new building is being erected for increasing corrugating capacity and power is being increased. At the Port Angeles, Wash., division, new Coen automatic oil burners are being installed and fuel storage added.

Important improvements at the big market sulfite pulp mills of Soundview Pulp Co. and Puget Sound Pulp & Timber Co. include big log hydraulic barkers and whole log chippers. Wood preparation at Inland Empire Paper Co., Spokane, call for improvements. At the Pacific Paperboard Co. in Longview, an additional tonnage output of about 75 tons a day is projected. A 70-ton-a-day increase in board and paper will result from Flintkote's $3,000,000 expansion in Los Angeles. Fernstrom Paper Mills will add a new paper machine and double capacity to 100 tons daily.

Wood room improvements are being carried out at Hawley Pulp & Paper Co., planning a big chipper to complement its big barker, Fir-Tex Insulating Board Co., Longview Fibre Co., Columbia River Paper Mills and Spaulding Pulp & Paper Co., among the Columbia River-Willamette River mills.

Production at Longview Fibre should show an increase, with many improvements going in there, but how much is uncertain. The others in the area, except those already mentioned, will not increase output materially.

Canadian Expansion

Emphasis continues to be on kraft in Canada's pulp and paper expansion.

Definitely planned or already under construction in Canada today are sulfate mills representing an expenditure totaling more than $45,000,000. These new projects are located in Ontario and British Columbia, the only two provinces in the dominion which are currently sharing in new pulp and paper mill development on a large scale.

More than 80% of the investment in new pulp mills in Canada is represented in Ontario enterprises.

Although a considerable amount is being spent on improvement of newsprint facilities, no plans are being made to bring about increased production of newsprint except at one of Ontario Paper Co.'s subsidiaries, but this will amount to only about 60 tons daily. The overall prospect, actually, is for a very slight reduction in Canada's newsprint production this year.

A few Canadian mills are increasing their production of fine paper, book paper, tissue and other spe-

cialties, but the added tonnage so far definitely scheduled is negligible.

But there is a genuine boom in kraft, and this is reflected in the launching of several important new projects along the north shore of Lake Superior, in the Georgian Bay district and also on the Pacific Coast.

New mills will be in operation or under construction this year in Canada representing a total production of kraft amounting to some 1,500 tons. Against this figure all other statistics of Canadian pulp and paper production increases seem insignificant.

Scanning a map of Canada from west to east for evidence of expansion in the industry, the first project is that of Bloedel, Stewart & Welch, Ltd., at Port Alberni on the west coast of Vancouver Island. This mill, to be ready to go into production April 1, 1947, with power from Campbell River, will produce 165 tons of unbleached kraft pulp daily.

Sorg Pulp Co. is currently engaged in an expansion program calling for expenditure of more than $1,000,000, and one of the effects will be to boost production of kraft pulp by 150 tons a day.

Up the coast at Ocean Falls, Pacific Mills, Ltd., is completely modernizing its kraft mill with the installation of continuous causticizing, and kraft pulp output will be stepped up 35 tons daily. At the same mill, where more than $500,000 is being spent on plant improvements, sulfite pulp output is also being increased 35 tons.

New equipment being installed at Westminster Paper Co. at New Westminster will virtually double production there, and the new construction program at Sidney Roofing & Paper Co. will also lead to greater output of pulp.

Financial interests supporting the proposed sulfite pulp mill at Giscome, near Prince George, B. C., are still holding their program in abeyance pending determination of the British Columbia government's long-term forest policy and a clarification of the labor future. A production of about 50 tons is contemplated. When and if the mill is built, proposed extension of the P. G. E. Railway should be an advantage.

At Red Rock, east of Fort William, Ont., Brompton Pulp & Paper Co. has been spending some $8,000,000 on the conversion of the Lake Sulfite Co. plant into a kraft producer, and the new mill went into production last fall, the present rate being 200 to 235 tons daily.

American Paper & Pulp Assn's. Estimated Increases in U. S. Annual Production Capacity During 1946

Grade	*Tons*
Book	229,000
Groundwood	35,000
Kraft	140,000
Tissue	143,000
Writing	74,000
Specialty	21,000
Sulfite, Glassine, etc.	9,000
Total Paper Grade	651,000
Paperboard	380,000
Roofing Paper	31,000
Total Increases	1,062,000

(For unlisted additional paperboard machine changes, it is estimated 280,000 tons might be added to the above figures).

Estimated Total Capacities End of 1946:

Paper Grades	10,442,000
Paperboard Grades	9,880,000
Total	20,322,000

A few miles east of Red Rock, also fronting on Lake Superior, is the site of Kimberly-Clark Corp.'s $15,000,000 sulfate pulp venture, which will produce about 250 tons of bleached sulfate pulp. At the same company's mill at Kapuskasing new equipment and processes have increased pulp output for crepe wadding.

A similar outlay is represented by Marathon Paper Mills of Canada's sulfate pulp mill a few miles further east on the lake front, where 300 tons of bleached kraft pulp will be produced daily this summer.

Down at Espanola, Ont., where Abitibi Power & Paper Co. used to operate a newsprint mill more than a decade ago, Kalamazoo Vegetable Parchment Co. has completely remodelled and rebuilt and reequipped a mill to produce 200 tons of bleached sulfate pulp daily.

Dryden Paper Co., in western Ontario, is boosting its sulfate output by 125 tons per day.

A new pulp dryer is to be in operation this summer at the La Tuque, Que., mill of Brown Corp. A program of expansion was completed early this year at Donnacona Paper Co., Donnacona, Que., boosting pulp and paper capacity 25 tons. Anglo-Canadian Pulp & Paper Mills, Quebec City, swinging over from news grade to unbleached sulfite pulp, has installed a dryer adding about 70 tons daily. Price Bros., Consolidated and Howard Smith mills are other operators in eastern Canada making improvements.

Almost every important pulp and paper mill in Canada is carrying out improvements of one kind or another even though they don't all add up to increased production. Extensive alterations are being made to mills in the Fort William and Three Rivers areas, for instance, as well as at other points in Ontario, Quebec and New Brunswick, while on the Pacific Coast, Powell River Co. is proceeding with a program designed to afford more complete utilization, improve plant efficiency and make more power available. Powell River Co. is laying the foundation for greater production, but the specific details have yet to be announced.

B. C. Pulp & Paper Co., operating mills at Woodfibre and Port Alice, is another west coast company that has been putting in new facilities without, however, planning immediate increase in tonnage.

NEW PAPER MACHINES SCHEDULED FOR DELIVERY TO U. S. MILLS IN 1946

(According to Writing Paper Mfg. Assn.)

No. of Machines—Type	*Daily Capacities in Tons*
5 Book	50, 50, 40, 100 and 110
(Rebuilt book machines—total 400 tons)	
1 Writing	90
1 Cigaret	8
3 Tissue	20, 30, 15
2 Towel tissue	30, 50
1 Crepe paper	30
3 Facial tissue	25, 18, 15
2 Kraft wrap	200, 250
1 Semiglassine	30
1 Specialty paper and bd.	25
1 Folding board	60
1 Heavy paper and board	65
3 Kraft board	300, 400, 400
1 Roofing felt	100
1 Insulating specialty	10
27 Total	2521

Installed 1941-1945 Inc.

1 Groundwood specialty	30
6 Cigaret	7(4); 7½(2)
3 Condenser	2, 2, 1
3 Tissue	18, 10, 15
3 Kraft wrap	75, 50, 165
2 Waxing	35, 35
2 Kraft board	500, 500
1 Roofing	30
21 Total	1511

Writing Paper Association's Estimate of U. S. Paper Percentage Increases in 1946

Grade	*Increase*
Writing and Fine Papers	3%
Book	4%
Groundwood	3%
Tissue	7%
Wrapping Papers	10%
Building Papers	5%
Total Paper	6%
Paperboard	2%
Total Paper and Board	4%

FUTURE MACHINE?

The picture in the background of the heading on this page is an artist's conception of a future paper mill machine. The Black-Clawson Co., to whom we are indebted for the picture, assures us this machine is not yet on the drafting board, but steps in this direction are being made right now—steps leading to modernization of all papermaking equipment.

Checking up on the experts. Industry near fulfillment of various prophecies. Paper consumption in U. S. may rise 5,000,000 tons.

Last year in the North American Review Number we led off its paper industry review and forecast of paper and paperboard by saying:

"The North American paper and paperboard industry may look forward to an interesting and profitable era of expansion in the immediate postwar years, limited only by the extent to which it can recover manpower losses, obtain modern equipment and an adequate supply of pulp and other manufacturing materials."

That "lead" paragraph could have been left standing in type for use in this 1946 North American Review Number. It's still good. The war is over, but there have been unforeseen lags and postponements. The future remains "interesting" and certainly it looks "profitable"—but there are still the limitations imposed by lack of manpower (especially at the woods end), by delayed delivery on equipment, and by the supply of pulp.

A number of predictions have been made in the past year and a half regarding the future of the paper industry.

It may be interesting now to review some of these forecasts, in the light of present efforts to meet a record high demand.

Perhaps the most recent prediction is that of George H. Chidester, chief of the pulp and paper division of the U. S. Forest Products Laboratory at Madison, Wis., who says that within five years annual consumption of paper in the United States will reach about 24,000,000 tons. (In 1945, U. S. consumption was 19,822,000 tons, running as usual nearly 2½ million tons over production, principally because of big newsprint imports).

Back in 1938, a former secretary of the American Paper & Pulp Association made the same prediction, virtually, that Mr. Chidester made only a few weeks ago. He was Charles W. Boyce and he predicted U. S. paper consumption of 24,000,000 tons by 1950.

But Mr. Boyce, who did not reckon with interference of a war and its restrictions, had also calculated 23,000,000 tons consumption in 1945. His graph is published on these pages and it shows that in 1941 his prediction was actually met. But since then, paper consumption in the U. S. has remained between 19,000,000 and 20,000,000 tons.

With WPB restrictions removed and if adequate raw materials are available the industry will certainly endeavor to supply enough paper to bring per capita consumption in the entire world to a new peak.

If the 1946 apparent per capita consumption is 308.9 lbs., as it was in 1941, the 140,000,000 people in continental U. S. should consume 21,600,000 tons of paper and paperboard during this year. Assuming that net imports of paper, that is imports less exports, come to 3,000,000 tons the required U. S. production would be 18,600,000 tons in 1946.

1946 Predictions

Predictions of U. S. paper production for 1946 range from 17,400,000 tons (which D. Clark Everest, president of Marathon Corp., merely described as a "requirement"

U. S. PULP PRODUCTION

Forecasts:	Tons
Mr. Housley (for 1947)	11,700,000
D. C. Everest (1946)	11,000,000
Department of Commerce (1946)	10,658,000
U. S. Pulp Producers Assn. (1946—twice 6 mos. forecast)	9,600,000
Department of Commerce (1947)	11,244,000
Department of Commerce ,1948)	11,694,000
Estimates of capacity:	
Mr. Housley	12,790,000
U. S. Pulp Producers Assn. (1945)	12,005,413
Past records:	
High (1942)	10,227,720
Last year (1945)	10,165,000
Pre-war (1939)	6,993,334
Depression low (1932)	3,760,267
Pre-depression high (1929)	4,862,885

U. S. PAPER PRODUCTION

Forecasts:	Tons
Mr. Housley (for 1947)	20,070,000
American Paper & Pulp Assn. (1946)	18,300,000
(If possible to meet 1941 per capita consumption rate)	18,600,000
Roy K. Ferguson (by 1950, or before)	20,000,000
D. C. Everest (1946 "requirement")	17,400,000
Department of Commerce (1946)	18,611,000
Department of Commerce (1946—another forecast)	18,000,000
Department of Commerce (1947)	19,221,000
Department of Commerce (1948)	19,157,000
E. W. Tinker, APPA (1947 potential)	18,740,000
Past records:	
High (1941)	17,762,365
Last year (1945)	17,374,208
Pre-war (1939)	13,509,642
Depression low (1932)	7,997,872
Pre-depression high (1929)	11,140,235

when he suggested the figure nearly a year ago) to 18,611,000 tons (which was calculated by a Department of Commerce trio of statisticians over a year ago).

Not long ago, Roy K. Ferguson, president of St. Regis Paper Co., told an audience of investment men:

"It would seem reasonable to expect further substantial growth in the consumption of paper products worldwide. Such a condition would require a higher annual production in the United States which might reach 20,000,000 tons in the next five years. It would appear as though the serious question for the industry during the next several years will be one of capacity production. With the expected rate of operation at maximum efficiency and with the elimination of excess profits taxes on corporations, it would appear that the pulp and paper companies are facing a prosperous period."

The report made over a year ago by Clifton W. Housley, then a statistician in the Forest Products Bureau of the War Production Board, predicted a production of 20,700,000 tons in 1947.

There are some optimists in the industry today who think that despite all lags and hazards, Mr. Housley's figure will be reached this year and that 1947 will see a production of 22,000,000 tons in the U. S.

However, nearly all the quotable authorities have been more cautious. D. Clark Everest, in a preview of the industry "following V-J Day" and presumably for this calendar year, put U. S. minimum need at 17,400,000 tons. This was merely to meet "requirements" for domestic consumption and exports.

A Department of Commerce forecast, compiled on the basis of a most comprehensive survey made last year by W. Leroy Neubrech, Donald Collier and the same Charley Boyce mentioned at the beginning of this article, forecast U. S. production of:

18,611,000 tons in 1946,
19,221,000 tons in 1947,
19,157,000 tons in 1948.

But a more recent Department of Commerce prediction for 1946 whittled off the above figure for that year to a round 18,000,000 and said imports from Canada would exceed 3,000,000 tons. (U. S. production was 17,374,208 tons in 1945 and imports were 2,775,000 tons).

APPA Forecast

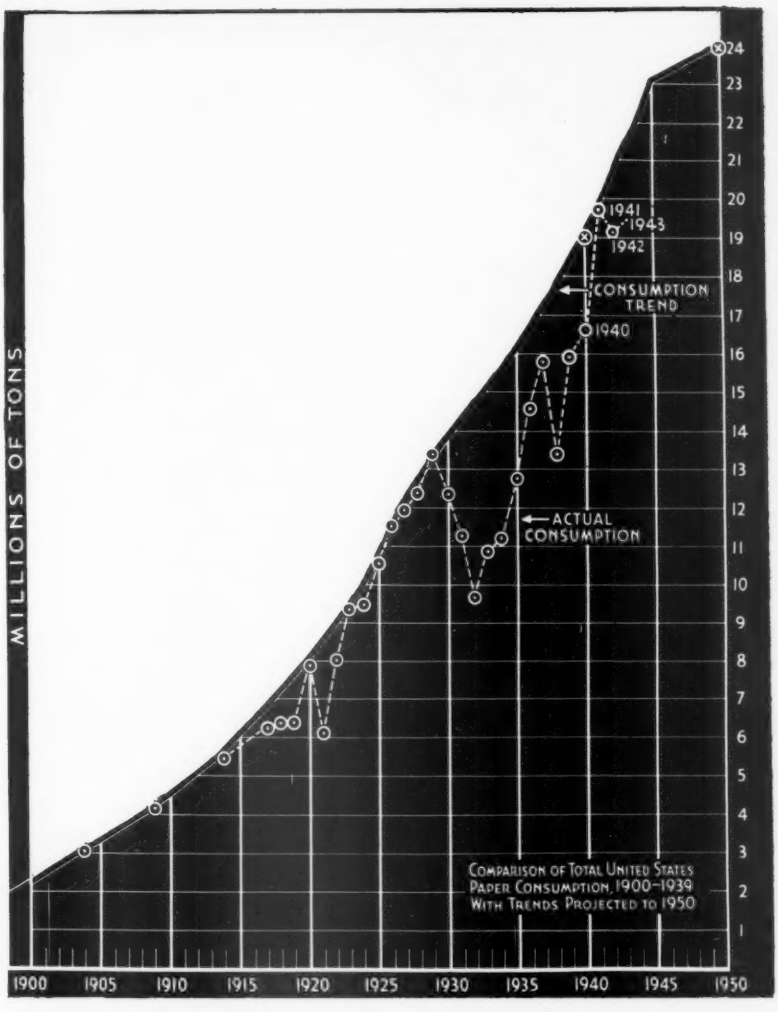
Recently, the American Paper & Pulp Association stated:

"Present indications are that, barring crippling strikes and raw material shortages, overall production in 1946 will reach about a million tons more or about 18,300,000 tons. Of this about one-half should be paper and the other half paperboard.

During the period of pulp allocation paperboard production was stimulated and production was depressed in certain grades of paper. Since the removal of WPB restrictions on October 1 there has been a definite trend the other way. Daily average paper production in October was 5.5% greater in 1945 than in 1944 while for paperboard production it was 3.3% less. Overall production at the daily rate reached in October will attain the 18,300,000 ton mark already mentioned. Present facilities therefore can produce that volume."

E. W. Tinker, executive secretary, cautioned, however, that there can be no assurance of raw material supply.

Mr. Tinker said these factors threaten to curb production: (1) lack of woods labor to replace war prisoners; (2) lack of incentive because of pulp price ceilings (he made this statement before recent increases) and (3) the usual Baltic

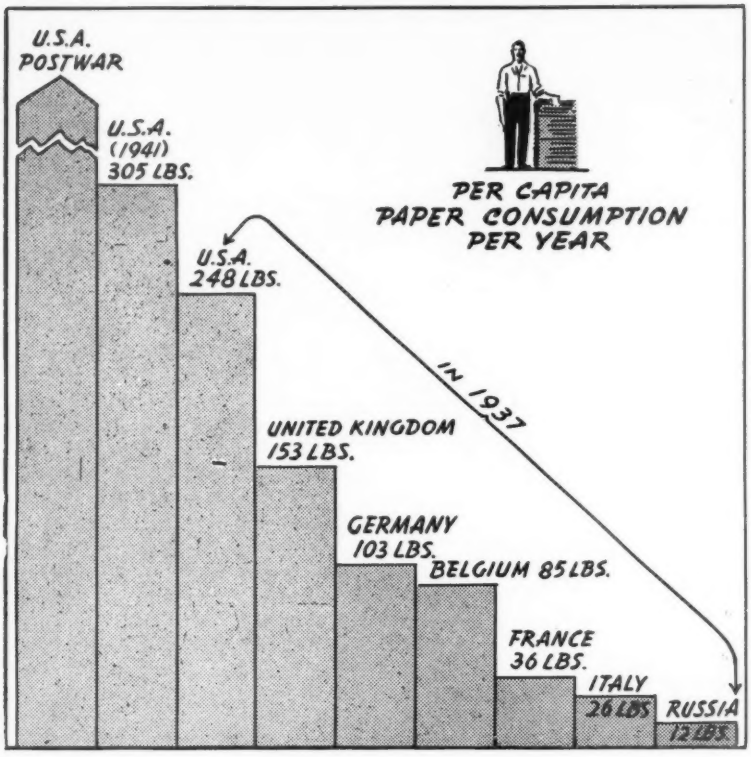


TREND OF PAPER CONSUMPTION IN THE UNITED STATES IS TOWARD a high record of 24,000,000 tons in 1950, according to two predictions. This was the figure conjured up only recently by George H. Chidester, of the U. S. Forest Products Laboratory.

It is interesting to note that the same prediction was made back in 1938 by Charles W. Boyce, then Secretary of the American Paper & Pulp Association, but more recently with the Department of Commerce.

Here we reprint a graph which we published a few years ago. It was drawn to an arithmetical vertical scale from a ration scale graph prepared in 1938 by Mr. Boyce, at a time when actual consumption was well below his predicted pace.

In only one war year—1941—did actual consumption meet his forecast, but he, of course, could not have foreseen the wartime restrictions and limitations. Actual consumption is carried on this chart to 1943. In 1944 and 1945 it continued to remain between 19- and 20,000,000 tons.



TAKING INTO ACCOUNT INCREASED POPULATION, U. S. consumption of paper in 1946 would be 21,600,000 tons if everyone got as much paper as in 1941—when the per capita rate was 305 lbs., as shown above.

Merely raising per capita consumption a few pounds per person in these countries would require a big increase in world paper production.

For instance, if Generalissimo Stalin increases the consumption level in Russia to what it was in Germany in 1937 he would need an additional 60,000 tons for his 193,000,000 people.

Some low rates of consumption in 1937—not shown above—were: Argentina, 29 lbs. per person; Japan, 23; China, 8; Mexico, 7; and India, one. Sweden used 149 lbs. per person.

If leading countries of Europe and Canada achieved 248 lbs. per capita consumption—U. S. 1937 rate—and other countries in Latin American and the Orient achieved only half that rate, the world consumption of paper would be 106 million tons a year. It was only 33 million tons in 1937.

freeze-up curbing Swedish pulp shipments.

Oliver M. Porter, executive director of the U. S. Pulp Producers Association, agrees there is no assurance of enough pulp for a million-ton paper production increase in 1946, although paper mill capacity and consumer demand warrant it.

Pulp demand will exceed supply during the first six months of 1946, said Mr. Porter. He holds out the hope that this may ease only during the last six months of the year.

Paper production at the rate achieved in the last quarter of 1945 can be maintained, he said, only in event the mills are willing to operate on "the pulp-starved furnish ratios of the last two years of war." This would mean inferior quality, which is hardly what is expected in peace time.

Views of Hayward and Everest

Ralph Hayward, president of Kalamazoo Vegetable Parchment Co., made this prophecy before war's end, and it is noteworthy that part of it already has been fulfilled:

"Demobilization will be slow and most men will want jobs in an industry rather than in the woods. It is going to take about two years after the war to build back inventories of pulp and paper. Starting a year or two after the war, consumption of paper products should be high throughout the world. The pulp industry should enjoy a full market for several years."

The substance of the forecasts made for this year by Mr. Everest follow:

U. S. paper production for domestic use—17,000,000 tons.

For export—400,000 tons.

U. S. pulp requirements—13,150,000 tons.

For paper production—12,400,000 tons.

For rayon and non-paper use—550,000 tons.

For export—200,000 tons.

U. S. pulp production—11,000,000 tons.

Pulp from Europe—1,200,000 tons.

Pulp from Canada—950,000 tons.

Here are estimates of wood pulp supply in the U. S. in 1946 (first six months) made by the U. S. Pulp Producers' Assn., compared with 1945 figures:

	Last 6 Mos. of 1945	First 6 Mos. of 1946
Imports from Canada	560,000	440,000
Imports from Europe	625,000	360,000
U. S. Production	4,940,000	4,800,000
Total	6,125,000	5,600,000

Pulp stocks on hand at U. S. mills —250,000 tons on July 1, 1945, and 495,000 tons on Nov. 1, 1945.

If the above figure for six months is doubled for the year 1946, it would indicate pulp production of 9,600,000 tons.

The Neubrech-Boyce-Collier Department of Commerce report had forecast U. S. pulp production of 10,658,000 tons, and, as mentioned above, Mr. Everest's forecast was for 11,000,000 tons.

These forecasts compare with actual 1945 production in the U. S. of 10,165,000 tons (according to U. S. Bureau of Census) and 1945 pulp-producing capacity of 12,005,413 tons (according to the U. S. Pulp Producers Association).

The agencies and all the gentlemen mentioned in this review are, of course, fully aware of the uncertainty regarding the pulp outlook. For instance, the big pulp mills of the Pacific Coast which are ordinarily capable of producing one-quarter of the U. S. market pulp, were forced on a five-day week early this year because of bad weather and a number of the big Southern and Coast pulp mills were temporarily shut down.

Predictions for V-E Years

The Housley report on post-war paper demand was published in PULP & PAPER INDUSTRY in the Jan., 1945, issue and the Department of Commerce world-wide forecast appeared in the Feb. 1945 issue.

The authors wrote at that time of hypothetical future years which

were called V-E 1, V-E 2, etc.—meaning one year, two years, etc., after Victory in Europe. It might be interesting at this time to take their predictions and fit them into actual years.

V-E Day was May 8—therefore, Housley's predictions of U. S. paper and pulp production and world pulp production were for 1947. The Department of Commerce report stipulated that if V-E Day fell within the first six or eight months of 1945, its world-wide forecasts were to be considered "reasonably sound" for the years 1946, 1947 and 1948.

Let us first consider Mr. Housley's projections:

Housley Predictions of U. S. Production for 1947

Grade	*Thousands of Tons*	*Thousands of Tons of Pulp Required*
Total paper and paperboard	20,070	12,860
Total paper	10,790	9,060
Newsprint	850	890
Grdwd., book and fine	4,300	3,312
Coarse & ship. sack	3,240	3,298
Special ind. and absorb.	300	257
Sanitary & tissue	1,100	1,109
Building papers	1,000	194
Total paperboard	9,280	3,800
Container bd.	4,300	2,421
Folding & set-up bxbd.	3,300	596
Building board	1,000	602
Miscellaneous (including cardboard)	680	181

"Paper and paperboard production in this country points to a new high level which may well approach 20 million tons annually in the early postwar period," wrote Mr. Housley. "The achievement of this level of production is predicated on the assumption that there will be an adequate supply of raw material and labor, that there will be a continuing high level of industrial activity after the war, and that the paper industry itself will be fully prepared—production and distribution-wise—to meet the expanding demands for paper and paper products.

His conclusion on the pulp situation in 1947 follows, in part:

"Assuming the demand for pulp in Europe is for 10 million tons, which is slightly higher than the 1935 level of 9.3 million tons, and that European production in that year will not exceed 10.8 million tons, the total surplus available for export to non-European countries will be about 800,000 tons. The foregoing estimate of European demand takes into consideration pulp requirements for the manufacture of paper and paperboard, rayon and other non-paper production, as well as the pulp needed to replenish inventories in the countries of Europe. If, however, inventories are substantially lower than have been estimated, the net exportable surplus of pulp from Europe will be less than the 800,000 tons indicated. United States pulp imports (in 1947) are not expected to exceed 500,000 tons annually. . . .

"The pulp required to produce a projected 20 million tons of paper in the United States, based on the 1st quarter 1944 pulp usage, amounts to about 12,860,000 tons. Assuming that domestic production can be increased to 11.7 million tons during the second year following V-E (1947) and that imports from Canada remain at a one-million-ton-level, a minimum of 660,000 tons would be needed from European sources to augment domestic and Canadian pulp in supplying United States needs."

Concerning wood supply, Mr. Housley wrote:

"It will be necessary to increase substantially receipts of wood (from both Canadian and domestic sources) over the present level of 17,400,000 cords per year. The production of 11.7 million tons of pulp would require about 19.3 million cords of wood."

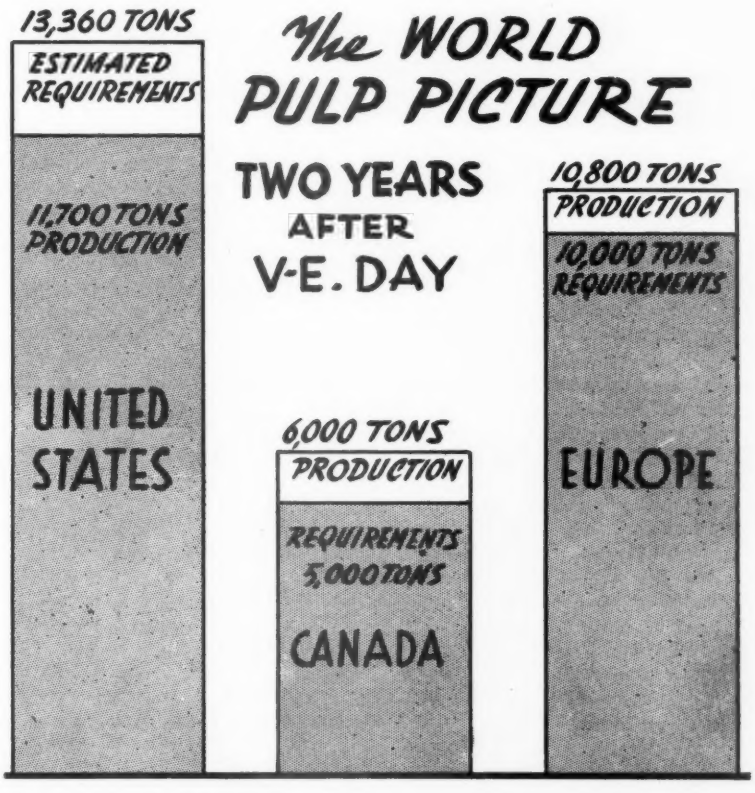
Dept. of Commerce Forecast

The tables on world production and consumption needs and estimates of world surpluses and deficits on pages 54-57 are from the "World Pulp and Paper Forecast" by the State Department.

This report said:

"The estimated world production of paper (in 1946) will be below world consumption needs by an estimated 1,027,000 short tons. In the second post-war year the analysis of world conditions indicates the production of paper will be greater than consumption needs, with an apparent surplus of 1,011,000 tons; in (1948) world production is expected again to be greater than consumption needs by 330,000 tons."

It is only fair to point out that the Department of Commerce statisticians expected a high paper de-



—According to the Housley Report on Postwar Paper and Paperboard Demand.

mand in 1946 on the basis of a continuing war with Japan. However, in predicting lower U. S. and world-wide consumption needs in the first years of peace, they may have erred.

The report went on:

"U. S. paper consumption needs in (1947) are estimated at about 1,500,000 tons less than in the first post-war year, while consumption needs in other countries throughout the world will have increased by approximately 2,000,000 tons, but at the same time world production will have risen about 2,600,000 tons.

"World wood pulp production in the first three years after V-E Day will be in approximate balance with consumption needs, according to expectations as set forth in this report, with indications of moderate surpluses. The world's production of wood pulp (in 1946), including pulp now in storage in Sweden, is estimated at 24,348,000 tons compared with estimated consumption needs of 23,822,000 tons, indicating a surplus of 526,000 tons. . . . For (1947) this surplus is estimated at 124,000 tons and for the third year at 113,000 tons.

"Production of wood pulp in the Northern European countries (in 1946) is estimated at 4,377,000 tons, to which may be added 600,000 tons to Swedish pulp in storage (now near 800,000 tons) making a total of 4,977,000 tons. Of this amount, it is estimated that a surplus over and above consumption needs of 3,354,000 tons will be available for export to other consuming countries. This compares with a 4,832,000-ton surplus in 1937. Estimates for (1947) disclose that the Northern European countries will have 3,728,000 tons for export and for (1948) an export surplus of 4,074,000 tons.

"If the U. S. is to meet its consumption needs for pulp (in 1946) it is estimated that 1,995,000 tons will have to be imported from foreign sources. This allows for exports of 275,000 tons which must be equalized by an equivalent amount of imports in addition to the net deficit between production and consumption needs. Imports in 1937 were 2,395,000 tons. For (1947) the U. S. will need 1,938,000 tons of foreign pulp and in (1948) 1,920,000 tons, allowing for U. S. exports, if near-capacity operations are achieved by the domestic industry.

"The U. S. consumption needs for paper in the first year after the European war, which will include 4,369,999 tons for military uses, is estimated at 22,522,000 tons, amounting to 68% of expected world con-

U. S. DEPARTMENT OF COMMERCE FORECAST OF PRODUCTION AND CONSUMPTION NEEDS OF SEVEN REGIONS OF THE WORLD

	Percent of World Production		Consumption Needs		Percent Production Greater or less than Consumption Needs	
	Paper	Pulp	Paper	Pulp	Paper	Pulp
(United Kingdom-France-Low Countries-Denmark)						
1937	15.2	2.8	18.8	14.4	— 18.1	— 80.3
1946	9.3	1.0	9.7	8.4	— 7.5	— 87.9
1947	10.2	1.4	11.8	10.2	— 11.4	— 85.9
1948	11.5	2.3	13.7	11.2	— 15.2	— 79.5
(Sweden-Norway-Finland)						
1937	7.1	26.5	2.2	8.5	+236.9	+215.6
1946	5.4	20.4	1.5	6.8	+253.1	+206.7
1947	6.0	21.9	1.7	7.8	+262.0	+183.0
1948	6.6	22.4	1.9	8.2	+242.0	+173.4
(Germany-Italy-Poland-Austria-Czechoslovakia)						
1937	16.0	14.9	14.3	14.9	+ 14.1	+ 4.5
1946	6.5	5.8	4.5	6.6	+ 40.7	— 9.9
1947	7.5	6.8	6.2	7.2	+ 24.7	— 5.2
1948	8.4	7.5	6.9	7.9	+ 23.2	— 4.3
(Russia-Baltic [Except Finland] and Balkan States-Spain-Portugal-Switzerland)						
1937	4.8	6.7	5.0	5.6	— 2.8	+ 19.7
1946	2.5	2.8	3.9	3.0	— 37.4	— 3.5
1947	3.2	3.3	4.7	3.8	— 29.8	— 12.8
1948	4.2	4.1	4.9	4.9	— 12.1	— 17.0
(Latin American Countries)						
1937	1.0	0.1	2.6	0.9	— 59.1	— 93.2
1946	1.8	0.3	4.0	1.6	— 56.5	— 78.4
1947	2.0	0.4	4.4	1.7	— 54.1	— 78.1
1948	2.0	0.4	4.5	1.7	— 55.4	— 76.8
(Canada-Newfoundland)						
1937	13.9	20.6	2.8	17.5	+408.1	+ 18.4
1946	14.1	22.9	3.2	18.3	+319.5	+ 27.5
1947	13.5	21.9	3.5	17.6	+304.2	+ 24.9
1948	13.4	20.9	3.4	17.0	+291.4	+ 23.6
(Asia [Except Russia]-Australia-New Zealand)						
1937	3.8	3.7	6.4	6.1	— 39.1	— 38.3
1946	2.4	3.0	5.0	3.4	— 54.4	— 9.5
1947	2.0	1.7	5.0	2.6	— 59.1	— 34.0
1948	2.1	1.8	5.3	2.7	— 61.0	— 33.9

Estimated World Paper and Wood Pulp Surplus (+) or Deficit (-)

(1,000 short tons)

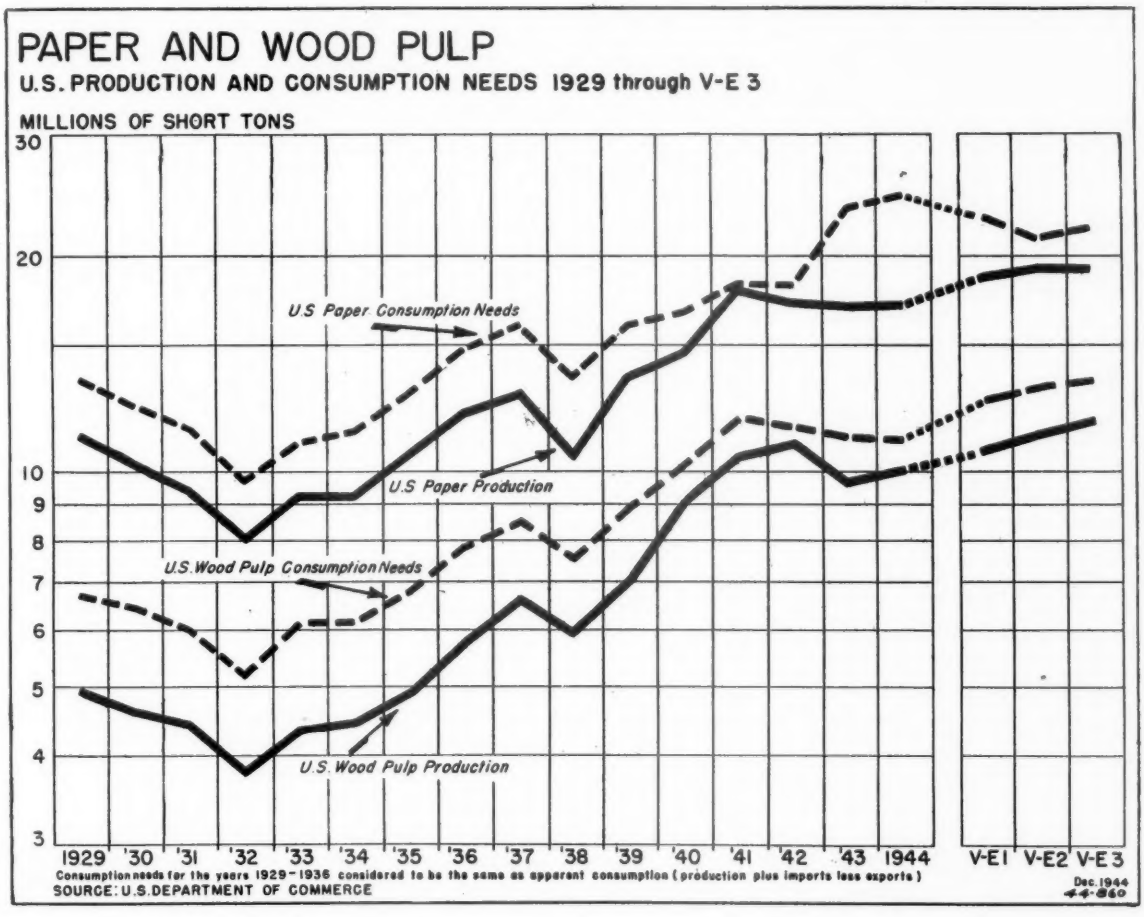
Year	Total for the world	World - other than the United States	United States
	Paper and Paperboard		
1937	+ 532	+ 3,624	- 3,092
V-E 1	- 1,027	+ 2,884	- 3,911
V-E 2	+ 1,011	+ 2,819	- 1,808
V-E 3	+ 330	+ 2,904	- 2,574
	Wood Pulp		
1937	+ 163	+ 2,078	- 1,915
V-E 1	+ 526	+ 2,246	- 1,720
V-E 2	+ 124	+ 1,762	- 1,638
V-E 3	+ 113	+ 1,708	- 1,595

Note: The surplus or deficit is calculated by relating production to consumption needs prior to export or import. When production is greater than consumption needs, the difference is considered to be a surplus (+). When production is less than consumption needs, the difference is considered to be a deficit (-).

THIS CHART accompanied the Department of Commerce forecast when it was published last year. V-E (Victory-in-Europe) Day was May 8, 1945, so—for the purposes of this chart—V-E 1 would be 1946; V-E 2, 1947, and V-E 3, 1948. In 1945 (not shown) U. S. paper and pulp consumption and paper production increased only a few hundred thousand tons over 1944 and pulp production was up only 56,000 tons. The basis for estimating United States consumption needs of paper was established by relating apparent consumption of paper (production plus imports less exports) for the years 1929 to 1939 to the non-durable goods segmment of the gross national product. The relationship established during this period is expressed by the regression equation $y = a + bx$, where (y) equals the consumption need and (x) equals the non-durable goods segment of gross national product in 1940 prices.

The year 1939 represents the last year in which apparent consumption can be considered equal to "consumption needs" (for civilian use), for in the following years apparent consumption includes military needs. It is, therefore, necessary to estimate the civilian and military needs separately. Paper mill reports to the War Production Board for the third quarter of 1943 and the first 6 months of 1944, which showed expected paper shipments by end-user groups, were used as a basis for determining the relationship between total dollar military expenditures and tonnage military paper needs.

United States estimates for the non-durable goods segment of gross national product, used as a basis to determine consumption needs, were supplied by the Business Statistics Unit. These estimates employ the same assumptions used throughout this report. They assume an unemployment volume of 5 to 6 million. Furthermore, they indicate that industrial activity in the V-E years will be about 21% above the 1939 level.


PAPER AND WOOD PULP
U.S. PRODUCTION AND CONSUMPTION NEEDS 1929 through V-E 3
MILLIONS OF SHORT TONS
30
20
10
9
8
7
6
5
4
3
U.S Paper Consumption Needs
U.S Paper Production
U.S. Wood Pulp Consumption Needs
U.S. Wood Pulp Production
1929 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40 '41 '42 '43 1944
V-E1 V-E2 V-E3
Consumption needs for the years 1929-1936 considered to be the same as apparent consumption (production plus imports less exports)
SOURCE: U.S. DEPARTMENT OF COMMERCE
Dec. 1944

sumption needs. The estimated domestic production of paper is 18,611,000 tons, which represents nearly full operation at anticipated practical operating capacity. The net U. S. deficit is thereby indicated at 3,911,000 tons whereas the surplus available from other world countries is 2,884,000 tons, leaving an apparent world shortage of 1,027,000 tons.

"In (1947 and 1948) both the consumption needs and production of paper in large European paper consuming countries will increase substantially. U. S. and Canadian output of paper will also increase. But U. S. consumption needs will decrease as the necessity for military uses diminishes. These shifts bring about an estimated world surplus of paper amounting to slightly over 1,000,000 tons in (1947) and 330,000 tons in (1948)."

In 1946, the report said, "the backward trek of labor from war production plants and from military service will gradually augment the labor supply for the industry (in the U. S.). Wood pulp production in (1946) is estimated at 10,658,000 tons.

"In (1947) there will be further improvements and expansion in going concerns. There will likewise be eliminations. It is assumed that these processes will offset each other during the first two post-war years. Maximum U. S. wood pulp production in (1947) is estimated at 11,244,000 tons."

The report said 1948 would be "the first year in which a net increase in wood pulp operating capacity of substantial proportions can be expected. How much this will be is difficult to estimate, especially in the case of market pulp for here numerous economic and political problems are involved, the solution of which may swing wood pulp production either up or down. A net increase of 450,-

000 tons in practical operating capacity is set up. This results in an estimate of U. S. wood pulp production in (1948) of 11,694,000 tons."

The Department of Commerce report also presented a table on estimated U. S. paper production for three years after V-E Day, compared with a realistic estimate of domestic and export needs to be met from U. S. production. This follows:

U. S. Paper Production

(In Thousands of Tons)

Year	Production	Needs
1946	18,611	20,117
1947	19,221	18,478
1948	19,157	18,930

The report concluded that in the next decade per capita consumption of paper in several countries could well approach the U. S. figures of more than 300 tons per person (most countries are far below this, many being in the 12 to 60 tons category).

"Looking beyond 1948, the report said "increased wood pulp production in terms of millions of tons will be needed" and that present indications are the bulk of this supply will come from U. S., Alaska, Canada and Soviet Russia.

Japan's Pulp-Paper Industry Over Ten Years

The number of paper mills in Japan in 1941 (before the war) was 467, with 782 machines and 32,000 laborers. As of October, 1945, this had been cut to 205 mills with 360 machines and 19,051 laborers. Forty-two mills suffered air raid damages, which were estimated at 23% of the total production capacity.

The largest paper manufacturer in Japan is the Oji Paper Co., whose production constitutes about 60% of the present output. Seventeen mills and 71 machines in Japan proper have production capacity of 483,000 tons. Nineteen of the machines were damaged in air raids.

With the forfeiture of territories, 17 subsidiaries of the Oji Paper Co. were lost. These mills had a total annual capacity of 325,000 tons, and included 9 in Karafuto (250,000 tons), 3 in Korea (35,000 tons) and 5 in Manchuria (40,000 tons).

Eighty-two wood pulp mills were reported in Japan during the war with an annual production of 754,000 tons, before air raid damage cut this production capacity by 101,160 tons. Three plants were listed as 90-100 per cent damaged in air attacks, and 2 as 10-49 per cent. No damage to any of the mills was so extensive as to require complete rebuilding.

JAPAN'S PAPER PRODUCTION

(*Short Tons*)

1935	1,132,168	1941	1,406,865
1936	1,214,029	1942	1,100,312
1937	1,435,793	1943	806,875
1938	1,264,366	1944	431,845
1939	1,449,836	1945 (est.)	256,000
1940	1,432,159		

DEPARTMENT OF COMMERCE FORECAST

PAPER AND PAPERBOARD: WORLD PRODUCTION COMPARED WITH CONSUMPTION NEEDS, BY GEOGRAPHICAL AREAS

(1,000 short tons)

1) World areas	Production				Consumption needs				Production greater (+) or less (-) than consumption needs			
	1937	YE-1	YE-2	YE-3	2) 1937	YE-1	YE-2	YE-3	1937	YE-1	YE-2	YE-3
Total for the world	33,727	32,061	34,604	36,947	33,195	33,088	33,593	36,617	+ 532	- 1,027	+ 1,011	+ 330
United States (total)	12,837	18,611	19,221	19,157	15,929	22,522	21,029	21,731	- 3,092	- 3,911	- 1,808	- 2,574
World other than the United States (total)	20,890	13,450	15,383	17,790	17,266	10,566	12,564	14,886	+ 3,624	+ 2,884	+ 2,819	+ 2,904
Europe	14,560	7,599	9,323	11,356	13,377	6,489	8,227	10,035	+ 1,183	+ 1,110	+ 1,096	+ 1,321
Northern	2,409	1,723	2,078	2,425	715	488	574	709	+ 1,694	+ 1,235	+ 1,504	+ 1,716
Western	5,118	2,973	3,541	4,256	6,251	3,213	3,997	5,020	- 1,133	- 240	- 456	- 764
Central & Eastern	5,411	2,086	2,604	3,106	4,743	1,483	2,068	2,521	+ 668	+ 603	+ 536	+ 585
Other Europe	1,622	817	1,100	1,569	1,668	1,305	1,568	1,785	- 46	- 488	- 468	- 216
Other American Republics	349	579	685	728	854	1,332	1,491	1,632	- 505	- 753	- 806	- 904
Canada and Newfoundland	4,695	4,510	4,685	4,944	924	1,075	1,159	1,263	+ 3,771	+ 3,435	+ 3,526	+ 3,681
Other World countries	1,286	762	690	762	2,111	1,670	1,687	1,956	- 825	- 908	- 997	- 1,194

WOOD PULP: WORLD PRODUCTION COMPARED WITH CONSUMPTION NEEDS, BY GEOGRAPHICAL AREAS

(1,000 short tons)

1) World areas	Production				Consumption needs				Production greater (+) or less (-) than consumption needs			
	1937	VE-1	VE-2	VE-3	2) 1937	VE-1	VE-2	VE-3	1937	VE-1	VE-2	VE-3
Total for the world	26,665	24,348	26,365	28,737	26,502	23,822	26,241	28,624	+ 163	+ 526	+ 124	+ 113
United States (Total)	6,573	10,658	11,244	11,694	8,488	12,378	12,882	13,289	- 1,915	- 1,720	- 1,638	- 1,595
World other than the United States (Total)	20,092	3) 13,690	15,121	17,043	18,014	3) 11,444	13,359	15,335	+ 2,078	+ 2,246	+ 1,762	+ 1,708
Europe	13,588	3) 7,309	8,807	10,408	11,512	3) 5,885	7,609	9,218	+ 2,076	+ 1,424	+ 1,198	+ 1,190
Northern	7,073	3) 4,977	5,765	6,424	2,241	3) 1,623	2,037	2,350	+ 4,832	+ 3,354	+ 3,728	+ 4,074
Western	755	240	377	657	3,826	1,990	2,681	3,204	- 3,071	- 1,750	- 2,304	- 2,547
Central & Eastern	3,971	1,406	1,793	2,152	3,950	1,561	1,891	2,249	+ 21	- 155	- 98	- 97
Other Europe	1,789	686	872	1,175	1,495	711	1,000	1,415	+ 294	- 25	- 128	- 240
Other American Republics	17	84	99	112	251	388	453	483	- 234	- 304	- 354	- 371
Canada and Newfoundland	5,494	5,569	5,764	6,017	4,641	4,367	4,614	4,868	+ 853	+ 1,202	+ 1,150	+ 1,149
Other World countries	993	728	451	506	1,610	804	683	766	- 617	- 76	- 232	- 260

1) The major wood pulp and paper producing and consuming countries of the world, with the exception of the United States have been grouped for purpose of this report as follows:
United States.
Northern Europe - Finland, Norway and Sweden. The Karelian Isthmus, formerly a part of Finland, has been included for all periods with the group "Other European countries".
Western Europe - Belgium, Denmark, France, Netherlands and United Kingdom.
Central and Eastern Europe - Austria, Czechoslovakia, Germany, Italy and Poland.
Other European countries - Bulgaria, Estonia, Greece, the Karelian Isthmus, Latvia, Lithunia, Portugal, Spain Switzerland, Turkey, Union of Soviet Socialist Republics and Yugoslavia.
Other American Republics - Includes all the Republics of Central America, South America and the West Indies.
Canada and Newfoundland
Other world countries - Australia, British India, China, Japan, Netherlands Indies, New Zealand, Philippine Islands and Union of South Africa.

2) Apparent consumption (production plus imports less exports).

3) This includes 600,000 tons of Swedish pulp in stock on VE-Day awaiting shipment.

Reduced debts and more working capital give strength to industry issues. Wall Street sees high activity. Canadian securities boom.

Last year in the North American Review Number was published the first financial tabulation of its type for the industry, showing comparative operating results and paper share statistics for all major companies reporting, together with a comparative salient balance sheet data.

The tabulations were carried from the year 1937, and they are in this issue brought up to date by the inclusion of 1945 figures.

These data are in the columns paralleling this article.

The financial experts and prognosticators have taken another sharp look at the pulp and paper industry—probably a bit sharper look than usual—and in the second quarter of 1946 they still find it attractive.

A trip "Downtown" in New York by PULP & PAPER INDUSTRY brought out statements like "the industry is well situated for its post-war operations" and "there are sharp profits gains ahead for the companies."

In making such statements the men of Wall Street have noted carefully the uncertainties of pulp and wood supply and woods labor, and have come out with the belief that "demand will continue to exceed production for some time, and new facilities will afford little relief until 1947."

In 1945, sales of the leading integrated companies rose slightly, but higher costs squeezed operating spreads, although lower taxes furnished some cushion so that earnings generally approximated the excellent showing of 1944.

Reasons for Optimism

The financial houses base their expectations of record consumption in 1946 on the prospects of high activity in non-durable goods, the major consumers of paper and paper products. They expect additional demands from increased exports, rebuilding of depleted inventories, and forward buying in anticipation of higher prices if controls should be removed. It is interesting to note that the analysts were not taking much note of either the attitude of the Swedish mills or labor conditions in the woodlands although some make tentative reference to "uncertainty of timber cutting." Speaking of the import situ-

COMPARATIVE OPERATING RESULTS AND PER SHARE STATISTICS

(Sales, Profits and Income in Thousands of Dollars)

	Net Sales	*Pre-Tax Profits	*Net Income	† Per Common Share ‡Earned	oDividends	oPrice Range
b-American Writing Paper Co. (Dec. 31):						
1939	$ 6,784	$ 286	$ 239	$0.67	Nil	2½-1¼
1941	8,713	195	137	0.32	Nil	3⅛-2¼
1943	9,355	821	245	0.65	Nil	5⅜-2½
1944	9,122	568	184	0.51	Nil	7¼-4⅛
f-1945	N.A.	N.A.	108	0.30	Nil	N. A.
b-Brown Co. (Nov. 30):						
1941	32,198	5,177	3,727	c25.79	Nil	c31½-25
1943	30,998	2,501	1,126	c 7.80	Nil	c36 -28¼
1944	32,329	2,513	1,298	c 8.99	Nil	c37 -31½
e-1945	N.A.	1,982	821	c 5.68	Nil	N. A.
Champion Paper & Fibre Co. (a-April 30):						
1937	22,415	1,851	1,557	1.98	$2.25	63¼-25⅛
1939	23,406	1,638	1,330	1.51	0.10	30 -17
1941	42,258	7,833	3,130	4.71	1.00	22⅜-14¾
1943	46,249	7,099	1,971	2.57	1.00	24 -18
1944	48,485	6,874	1,804	2.04	1.00	31¼-23
e-1945	N.A.	3,082	1,193	1.53	1.25	55 -28½
Consolidated Paper Co. (Dec. 31):						
1937	12,815	1,614	1,302	1.74	2.00	22 -14
1939	9,786	1,136	933	1.24	1.00	17 -13
1941	15,367	2,905	1,449	1.93	1.25	16¼-15
1943	17,976	3,106	1,222	1.63	1.00	15¾-12
1944	18,323	2,796	1,072	1.43	1.50	17½-14⅞
1945	17,773	1,640	921	1.23	1.00	23 -18
Container Corp. of America (Dec. 31):						
1937	25,268	2,312	1,784	2.28	1.20	37⅜-10¾
1939	24,115	1,742	1,449	1.85	0.25	17¼- 9⅛
1941	46,714	6,742	2,327	2.98	1.50	16½-11
1943	61,164	10,384	2,684	3.45	1.50	23¾-16
1944	69,641	11,113	2,663	3.41	1.50	29⅜-20
1945	74,138	9,316	2,326	2.97	1.50	40½-26⅛
Crown Zellerbach Corp. (a-April 30):						
1937	49,891	7,488	6,211	1.58	0.25	25¼- 8½
1939	56,527	10,324	8,119	2.42	0.50	17⅜- 9
1941	86,336	20,103	11,109	3.74	1.00	15⅜-10
1943	97,834	15,432	7,603	2.19	1.00	17 -11½
1944	98,814	13,700	7,093	1.97	1.00	22½-15½
f-1945	75,759	11,232	5,706	1.74	1.00	30⅞-20⅜
Eddy Paper Corp. (Dec. 31):						
1937	9,694	785	650	3.65	3.00	41¼-18½
1939	8,578	394	328	1.77	0.50	19¼-14⅛
1941	14,972	2,233	833	4.50	2.00	21 -13½
1943	14,369	3,008	768	4.68	3.50	28½-22
1944	16,020	3,924	1,059	6.44	4.50	38 -25
1945	N.A.	N.A.	N.A.	N.A.	4.50	52 -39
Gair (Robert) Co., Inc. (Dec. 31):						
1937	21,655	794	557	Nil	Nil	15⅜- 3
1939	14,735	d624	d634	**	Nil	5⅞- 2
1941	23,393	2,465	1,127	0.80	0.25	2¾- 1¼
1943	26,576	3,146	969	0.66	0.30	4⅛- 1⅜
1944	27,640	2,766	761	0.48	0.30	5¼- 2⅞
1945	28,093	2,199	715	0.33	0.30	10¾- 4½

(Table continues on next page)

ation generally, most experts do not expect Scandinavian pulp—real or projected—to exert downpull pressure on prices. Reason: the growing uses for wood pulp in rayon and plastics fields. They also consider the demand of European countries for Swedish pulp.

Companies well situated to share in the expansion of "white paper" sales are looked on with considerable favor. Agreeing that labor costs may be higher, it is felt that better prices will allow the retention of margins. Neither have the experts given up hope of "some possible increase in prices." And they also weigh in the repeal of the excess profits tax and look for higher gain in earnings and larger dividends.

Record Container Earnings Seen

Record earnings are expected, too, from the container companies. Large industrial requirements are expected to bring demand for paperboard and kraft at least to the 1945 peak. Accumulated orders are already large, and improved packaging, especially in the food industry, is being considered as a factor in the predictions. Such factors are expected to overcome the sharp shrinkage in military demands.

As every executive knows well, the effects of the war on the industry were certainly extensive—and the financial world likes the general look of those effects. It recalls that in a prosperous year (1939) the industry was operating at only 80% of capacity, and that price competition was severe while the demands were declining and fixed charges were heavy. Earnings therefore fluctuated over a cyclical range. The war altered this almost at once. By 1941 the industry was operating at 96% of capacity and earnings were excellent. There was a drop in 1942 due to anticipatory consumer buying, and in 1943 pulp and manpower shortages had their effect. The decline to 80% of capacity in 1944 was due to acute shortages in materials and labor. Price, production and consumption controls have been reducing earnings from the 1941 level.

But that is history, and now with

COMPARATIVE OPERATING RESULTS AND PAPER SHARE STATISTICS (Continued)

(Sales, Profits and Income in Thousands of Dollars)

	Net Sales	*Pre-Tax Profits	*Net Income	† Per Common Share ‡Earned	oDividends	oPrice Range
Gaylord Container Corp. (Dec. 31):						
1937	13,480	2,307	1,765	2.76	0.75	
1939	13,660	809	662	0.71	0.70	18¾- 9⅜
1941	25,281	3,970	1,749	2.72	1.00	12½- 8⅜
1943	31,708	3,153	1,243	1.82	1.00	14¾- 9¾
1944	33,945	3,851	1,287	1.90	1.00	23½-13¼
1945	N.A.	N.A.	1,105	1.54	1.00	40¼-23
Great Northern Paper Co. (Dec. 31):						
1937	N.A.	2,577	2,178	2.18	2.00	47 -27
1939	N.A.	3,296	2,727	2.73	2.40	45 -33
1941	N.A.	3,815	2,432	2.44	2.50	42 -29½
1943	N.A.	3,097	1,860	1.86	1.60	36 -27¼
1944	N.A.	2,775	1,667	1.67	1.60	37½-29¼
f-1945	N.A.	1,417	852	0.85	1.60	47½-35½
Hammermill Paper Co. (Dec. 31):						
1937	7,443	580	450	1.25	3.00	N. A.
1939	7,330	623	463	1.83	0.50	28½-18
1941	10,703	1,351	671	3.11	1.25	25¼-15¾
1943	11,424	1,663	585	2.64	1.00	25 -17½
1944	12,570	1,591	454	1.92	1.00	29 -19⅜
1945	11,856	1,087	528	2.35	1.00	42½-27
Hinde && Dauch Paper Co. (Dec. 31):						
1937	15,827	1,778	1,428	3.61	2.00	37 -16⅛
1939	13,845	1,091	912	2.04	1.00	19 -14¾
1941	22,490	3,346	1,446	3.42	1.50	16½-12½
1943	24,848	3,574	1,197	2.83	1.50	21⅜-14½
1944	24,357	3,368	1,148	2.69	1.50	25½-19¾
1945	24,054	2,749	999	2.01	1.00	33¾-25
International Paper Co. (Dec. 31):						
1937	123,487	11,780	9,135	2.47	Nil	19¼- 6¼
1939	122,290	5,709	4,894	0.14	Nil	14¾- 6⅜
1941	214,334	43,751	16,254	6.37	Nil	20 -10⅞
1943	216,123	32,451	10,120	3.01	Nil	14¾- 8¼
1944	231,572	35,833	10,560	3.26	Nil	21⅞-13⅛
f-1945	177,532	27,078	8,694	2.87	Nil	48¾-19½
Kimberly-Clark Corp. (Dec. 31):						
1937	27,250	3,124	2,360	3.61	2.00	46¾-17¾
1939	27,861	3,561	2,651	4.21	1.75	38 -20
1941	36,959	5,818	3,104	5.13	2.25	38 -25
1943	57,488	6,694	2,550	4.00	1.75	34 -25
1944	61,331	6,125	2,422	3.09	2.00	42 -31½
f-1945	42,300	4,640	1,918	2.62	2.00	67 -38⅜
Marathon Corp. (Oct. 31):						
1937	N.A.	1,087	857	2.06	g1.50	44 -17
1939	13,298	724	592	1.31	0.50	24½-16¼
1941	18,081	2,012	1,205	2.84	0.75	18 -12
1943	25,381	5,008	1,286	3.04	1.00	21¼-16½
1944	29,856	5,979	1,603	3.75	1.00	32¾-18½
1945	31,941	5,602	1,360	2.78	1.00	59 -32
Mead Corporation (Dec. 31):						
1937	25,373	2,278	1,841	2.40	1.50	34¾-10
1939	21,987	915	744	0.46	Nil	14⅜- 6
1941	32,452	3,761	2,110	2.66	0.75	9⅝- 5
1943	36,878	2,981	1,153	1.00	0.60	10¾- 6
1944	39,920	3,223	1,213	1.09	0.60	13 - 8
g-1945	30,981	1,960	819	0.67	0.70	25 -12⅜
National Container Corp. (Dec. 31):						
1937	3,065	357	312	0.47	0.25	14⅜- 6½
1939	4,864	434	358	0.54	0.20	10⅝- 5
1941	9,207	2,729	1,073	1.63	0.62½	12⅞- 8⅜
1943	12,969	3,191	817	1.24	0.50	13½-10¾
1944	17,656	4,474	1,191	1.80	0.90	14½-10
1945	18,767	4,112	1,186	1.68	§0.85	32¾-12⅞
Oxford Paper Co. (Dec. 31):						
1937	N.A.	934	800	0.75	Nil	20 - 7¾
1939	N.A.	825	674	0.42	Nil	8¾- 2
1941	N.A.	1,996	1,057	1.44	Nil	6⅝- 3½
1943	N.A.	2,169	914	1.07	Nil	3½- 1⅝
1944	N.A.	2,216	1,024	1.36	Nil	8¼- 3¾
1945	N.A.	2,104	974	1.23	Nil	N.A.
Rayonier Incorporated (a-April 30):						
1937	17,496	3,746	3,125	1.94	N.A.	N.A.
1939	16,292	2,887	2,389	1.18	Nil	19 - 6⅞
1941	31,317	9,080	3,570	2.40	0.75	18½- 8¾
1943	22,824	2,489	1,689	0.45	0.87½	15½-11¼
1944	25,970	3,624	1,839	0.61	Nil	18 -12¼
f-1945	N.A.	1,530	917	d0.02	Nil	25 -16

(Table continued on next page)

COMPARATIVE OPERATING RESULTS AND PAPER SHARE STATISTICS (Continued)

(Sales, Profits and Income in Thousands of Dollars)

	Net Sales	*Pre-Tax Profits	Net Income	† Per Common Share ‡Earned	oDividends	oPrice Range
St. Regis Paper Co. (Dec. 31):						
1937	14,869	1,599	1,228	0.22	Nil	11¾- 2⅜
1939	15,359	705	548	0.06	Nil	4½- 1⅜
1941	30,000	5,247	3,228	0.71	Nil	2⅜- 1¼
1943	25,528	2,910	1,856	0.38	Nii	4¾- 1½
1944	48,388	5,398	1,854	0.36	Nil	6⅜- 4⅛
1945	52,501	N.A.	2,211	0.45	Nil	12 - 5⅝
Scott Paper Co. (Dec. 31):						
1937	13,844	1,603	1,249	2.19	1.55	45¼-34½
1939	18,517	2,512	1,886	2.65	1.85	52⅛-44½
1941	27,076	3,277	1,940	2.52	1.95	39½-31
1943	30,570	2,692	1,535	1.91	1.80	43 -36¼
1944	31,467	2,972	1,566	1.96	1.80	45⅛-37½
1945	37,680	3,154	1,756	1.87	1.80	61½-42⅜
Sutherland Paper Co. (Dec. 31):						
1937	8,137	997	805	2.80	1.80	39⅞-17½
1939	8,490	866	723	2.52	1.30	30½-22¾
1941	12,843	1,574	818	2.85	1.25	23¼-16⅛
1943	15,479	2,541	818	2.85	1.25	33 -26¼
1944	14,947	2,260	710	2.47	1.35	34 -29
1945	14,908	1,470	609	2.12	1.35	42½-31
Union Bag & Paper Corp. (Dec. 31):						
1937	15,691	1,675	1,385	1.32	0.50	18⅜- 8⅞
1939	17,562	1,134	966	0.76	Nil	13⅛- 6
1941	27,871	5,619	2,168	1.70	1.00	12¾- 7
1943	33,555	2,767	1,058	0.83	0.30	11¾- 8
1944	39,021	6,722	1,584	1.25	0.75	15½- 9¼
1945	41,391	6,408	1,646	1.30	0.85	26⅞-14¼
West Virginia Pulp & Paper Co. (Oct. 31):						
1937	31,413	3,516	2,862	2.14	0.70	41 -15½
1939	29,760	1,240	1,095	0.18	0.20	19⅛- 9½
1941	47,521	6,820	4,520	3.97	1.80	20⅞-15
1943	53,715	7,662	2,610	1.86	1.25	16¾-11¾
1944	59,098	6,484	2,384	1.80	1.00	28 -16½
1945	59,188	5,442	2,142	1.63	1.00	40 -22¾
Columbia River Paper Mills (Dec. 31):						
1937	N.A.	62	47	1.05	N.A.	N.A.
1939	N.A.	N.A.	d53	d3.44	N.A.	N.A.
1941	N.A.	510	340	16.67	N.A.	N.A.
1943	N.A.	141	91	4.24	N.A.	N.A.
1944	N.A.	280	155	7.77	N.A.	N.A.
Minnesota & Ontario Paper Co. (Dec. 31):						
1941	22,029	3,422	2,628	1.96	Nil	4¾- 2⅛
1943	23,677	2,464	1,464	1.09	Nil	9⅞- 3¾
1944	23,770	2,043	1,125	0.84	Nil	12 - 7¼
f-1945	18,271	1,675	990	0.73	Nil	N.A.
Puget Sound Pulp & Timber Co. (Dec. 31):						
1937	3,043	311	255	0.72	0.75	19½- 7
1939	3,028	116	99	d0.20	Nil	13 - 3⅜
1941	8,379	3,123	1,076	3.08	2.00	18⅜-14
1943	6,373	1,057	457	1.19	0.50	13 - 7
1944	6,469	h1,413	h938	h2.66	1.00	17 -11⅝
1945	6,328	N.A.	h603	h1.64	1.00	N.A.
Soundview Pulp Co. (Dec. 31):						
1937	6,537	1,987	1,627	3.07	3.00	N.A.
1939	5,768	679	565	0.90	0.25	29¾-11
1941	13,019	4,814	1,794	3.42	2.00	23½-13¾
1943	10,706	1,845	810	1.40	2.00	21 -15¼
1944	11,682	1,991	754	1.29	1.40	23½-18½
1945	N.A.	N.A.	N.A.	N.A.	1.20	N.A.
Canadian—						
Abitibi Power & Paper Co., Ltd. (Dec. 31):						
1937	21,755	3,054	3,054	**	Nil	c97 -60
1939	16,146	1,660	1,660	**	Nil	c36 - 4
1941	27,038	5,626	5,626	**	Nil	c15 - 8
1943	29,940	i1,931	i931	**	Nil	c62 -12½
1944	28,211	i2,294	i1,044	**	Nil	146¼-58

(Table continued on next page)

a gradual betterment in almost all factors, it is indicated that a reversal of the trend is the order of the day. Two things the financial world approves in a marked fashion are the diversified uses of paper, and the growing importance of by-products. The potential uses of paper in the commercial field appear literally "unlimited"—a word used with care by dependable analysts. As for by-products, the experts have been watching with interest the research in lignin, plastic pulp, fiberboard construction materials, and others.

Financial Status Strong

But unquestionably one of the strongest points about pulp and paper stocks generally has been the strengthening of finances to bolster equities. As everybody knows, paper stocks have been highly speculative, extremely sensitive as a result of overcapacity in the past. The situation prior to the war was accented by leverages provided by large senior capitalizations. But meanwhile huge wartime earnings have been applied in part to reduce debt and retire preferred stocks. Some issues, too, have been refunded. Working capital has been built up in several instances. And certainly productive capacity has not kept pace with what the experts call "the secular trend of consumption."

The long-term forecasts of the experts on individual companies are, in the majority of cases, extremely bright. In the majority of cases, too, the finances of individual companies are regarded as "improved," "satisfactory" or "sound."

Canadian Pulp and Paper Mill Securities

Canadian pulp and paper securities have been experiencing a boom for more than three years, and in their upward climb have outdistanced the rise of other Canadian stock market prices generally. Unlike many market leaders of the past few years, pulp and paper issues obviously stood to gain from a return to peacetime conditions and this fact was largely responsible for the recent bullish tendency.

The Montreal stock exchange average of 10 paper stocks during the early months of this year fluctuated above 330, compared with the wartime low of 47.92.

Individual stocks and groups within the pulp and paper industry

have shown varied changes. For instance, stocks of companies whose main activity has been the production of newsprint and which dropped most sharply early in the war, have had proportionately the largest gains in recent years, whereas value improvements in case of some special and fine paper manufacturers have not been so abrupt lately.

At the outbreak of the war, Canadian pulp and paper securities showed a considerable strength for a time, but in 1940 they plunged downward. The market regarded the industry as one that was not primarily manufacturing for war purposes and would therefore have a low priority on manpower and supplies whereas costs of production and taxation would continue to rise.

Increased Investment Interest

Conversely, evidence of a turn in the tide of war, with increasing likelihood that ultimate victory was largely a question of time, such as began to appear late in 1942, increased investment interest in the pulp and paper industry as one standing to benefit from the termination of war.

Actually, during the war, the Canadian pulp and paper industry played an important wartime role, not only in maintaining supply of its customary product but in converting its machine shops for the manufacture of munitions and in developing output of new materials to replace metals, wood and other goods in short supply. However, the industry was obliged to take a secondary place to munition plants in claims on available manpower, electric power and other supplies, and output has accordingly been less than demand.

One result of this situation, of course, is that there is a tremendous backlog of requirements for almost everything the industry produces. It is estimated that several years will elapse before world shortages of pulp products can be overcome and adequate reserve supplies again restored.

Classed as "Growth Industry"

Pulp and paper are in the category of a "growth" industry—one likely to increase revenues and profits as normal supplies of manpower and materials are restored. Extent of profit improvement will depend a good deal on government taxation policy.

Extent of market price improvement for pulp and paper securities is indicated in the following representative list of junior securities:

COMPARATIVE OPERATING RESULTS AND PER SHARE STATISTICS

(Sales, Profits and Income in Thousands of Dollars)

	Net Sales	*Pre-Tax Profits	*Net Income	† Per Common Share ‡Earned	oDividends	oPrice Range
British Columbia Pulp & Paper Co., Ltd. (Dec. 31):						
1937	N.A.	355	225	1.86	Nil	48 - 9
1939	N.A.	d138	d147	d1.86	Nil	10 - 6
1941	N.A.	2,101	601	5.62	Nil	11 - 7
1943	N.A.	264	164	1.25	Nil	8 - 8
1944	N.A.	653	368	3.29	Nil	17 -17
1945	N.A.	978	440	4.39	Nil	N. A.
Consolidated Paper Corp. Ltd. (Dec. 31):						
1940	N.A.	1,282	875	0.34	Nil	8½- 3⅛
1941	N.A.	1,520	880	0.34	Nil	4⅛- 2½
1943	N.A.	2,294	1,294	0.50	Nil	6⅜- 3
1944	N.A.	2,708	1,108	0.43	Nil	8¼- 5½
Donnacona Paper Co., Ltd. (Dec. 31):						
1937	N.A.	50	41	0.11	Nil	17½- 7¼
1939	N.A.	11	9	0.02	Nil	N.A.
1941	N.A.	183	105	0.28	0.10	3½- 3⅛
1943	N.A.	345	195	0.52	Nil	7⅜- 3¾
1944	N.A.	474	274	0.72	Nil	8¾- 7
1945	N.A.	539	289	0.77	0.50	N.A.
Powell River Co., Ltd. (Dec. 31):						
1937	N.A.	1,977	1,481	1.11	N.A.	N.A.
1939	N.A.	3,548	2,602	1.94	N.A.	N.A.
1941	N.A.	5,627	2,672	1.99	1.80	N.A.
1943	N.A.	4,306	1,737	1.29	1.27	N.A.
1944	N.A.	4,526	2,107	1.57	1.05	N.A.

*Adjusted for effects of renegotiation (where reported) and inclusion of special voluntary reserves created after taxes. †-Adjusted for split-ups. ‡-Disregarding preferred stock dividend arrears, if any. o-Calendar years. N.A.-Not available. d-Deficit. **Not computable on basis comparable with later years.

a-In order to conform with data for other companies, fiscal periods are those ending April 30 of following year.

b-Since reorganization. c Per share statistics are for preferred stock. e-28 weeks.

f-Nine months. g-46 weeks. •-Paid in preferred stock. §Plus 10% in stock. (Footnotes to Balance Sheet Data should be read in conjunction herewith).

h-Includes capital gain from sale of Canadian subsidiary.

i-After deducting interest reserve payable.

Note: The foregoing information has been obtained from sources believed to be reliable but is not guaranteed. No responsibility is claimed for the accuracy of the statistical preparation.

COMPARATIVE SALIENT BALANCE SHEET DATA

(In Thousands of Dollars)

Fiscal Year-end	Total Assets	*Net Fixed Assets	Inventories	Net Working Capital	Funded Dept, etc.	Preferred Stock	Minority Interests	†No. Com. Shares Outstanding
1937	$8,782	$6,487	$1,173	$1,980	$3,072	Nil	Nil	416,028
b American Writing Paper Corp. (Dec. 31):								
1939	8,840	6,272	1,414	1,877	2,316	Nil	Nil	416,068
1944	9,596	4,924	1,040	3,638	2,006	Nil	Nil	360,224
c Brown Co. (Nov. 30):								
1941	44,854	26,205	7,424	12,887	17,349p	$14,448	Nil	1,999,659
1942	43,104	25,303	8,803	11,774	14,853 p	14,448	Nil	1,999,659
1944	42,146	22,429	10,276	13,746	15,327 p	14,448	Nil	1,999,659
Champion Paper & Fibre Co. (a April 30):								
1936	32,150	21,688	5,076	4,464	5,013	7,750	Nil	551,000
1939	38,385	26,582	5,026	6,401	10,415	8,779	Nil	550,700
1943	50,236	24,385	7,344	20,344	11,455	11,500	$84	550,000
1944	51,899	23,336	7,284	20,905	10,900	11,500	103	546,000
Consolidated Paper Co. (Dec. 31):								
1936	11,344	7,036	1,378	3,282	Nil	Nil	Nil	750,000
1939	8,755	3,469	1,790	4,292	Nil	Nil	Nil	750,000
1944	12,368	2,238	1,260	6,717	Nil	Nil	Nil	750,000
Container Corp. of America (Dec. 31):								
1936	23,633	17,371	2,901	3,544	6,981	Nil	Nil	653,540
1939	26,110	17,617	3,644	4,710	5,126	Nil	Nil	781,253
1944	28,119	15,500	3,737	6,635	Nil	Nil	Nil	781,253
1945	30,529	15,499	4,529	9,078	Nil	Nil	Nil	781,253

(Table continued on next page)

COMPARATIVE SALIENT BALANCE SHEET DATA

(In Thousands of Dollars)

Fiscal Year-end	Total Assets	*Net Fixed Assets	Inventories	Net Working Capital	Funded Debt, etc.	Preferred Stock	Minority Interests	†No. Com. Shares Outstanding
Crown Zellerbach Corp. (a April 30):								
1936	104,600	66,382	11,913	13,204	19,278	52,965	1,212	2,261,199
1939	103,037	62,653	12,741	17,703	13,800	52,966	1,187	2,261,199
1943	105,164	60,386	18,591	29,814	2,573	52,966	1,254	2,261,199
1944	105,706	58,505	16,400	30,599	Nil	52,966	1,262	2,261,199
Eddy Paper Corp. (Dec. 31):								
1936	6,730	4,532	1,407	1,491	105	Nil	Nil	177,900
1939	8,157	4,389	1,119	1,134	488	Nil	Nil	185,045
1944	11,299	1,944	998	3,745	Nil	Nil	Nil	164,535
Gair (Robert) Co., Inc. (Dec. 31):								
1936	18,469	12,529	3,076	2,902	4,825	p9,280	650	574,613
1939	17,093	7,819	2,032	1,662	3,563	p9,310	650	574,646
1944	15,552	7,672	2,032	4,126	3,305	3,728	650	1,133,822
1945	17,427	7,988	2,891	5,727	3,000	5,680	650	1,231,447
d Gaylord Container Corp. (Dec. 31):								
1937	12,872	7,765	1,518	3,445	Nil	5,000	Nil	539,221
1939	12,967	8,034	1,604	3,266	Nil	5,315	Nil	539,221
1944	21,245	11,028	3,607	7,177	5,287	4,511	Nil	541,821
Great Northern Paper Co. (Dec. 31):								
1936	42,604	27,217	7,740	13,356	Nil	Nil	Nil	997,580
1939	43,567	29,057	6,436	12,684	Nil	Nil	Nil	997,480
1944	44,774	28,996	5,663	12,700	Nil	Nil	Nil	997,480
Hammermill Paper Co. (Dec. 31):								
1936	11,882	6,309	1,805	2,833	270	3,803	Nil	180,000
1939	11,051	5,717	2,097	3,790	Nil	2,500	Nil	180,000
1944	12,716	5,204	1,912	5,180	Nil	2,420	Nil	180,000
1945	18,710	5,483	2,476	5,930	5,000	3,670	Nil	180,000
Hinde & Dauch Paper Co. (Dec. 31):								
1936	11,897	5,754	1,972	3,307	490	3,608	Nil	360,000
1939	12,565	5,987	2,085	3,702	544	3,590	Nil	360,250
1944	14,648	5,315	2,408	5,154	Nil	3,590	Nil	360,250
1945	14,997	5,368	2,538	5,655	Nil	1,470	Nil	427,824
e International Paper Co. (Dec. 31):								
1936	240,555	179,178	26,588	35,250	80,730	p91,349	15,833	1,822,243
1939	219,867	158,507	25,600	35,605	58,851	p92,594	Nil	1,823,270
1944	249,196	131,402	29,228	71,122	48,796	p92,597	Nil	1,823,855
Kimberly-Clark Corp. (Dec. 31):								
1936	45,788	28,246	4,096	4,004	5,116	9,963	Nil	487,173
1939	50,858	24,508	5,141	7,688	8,600	9,963	Nil	488,173
1944	61,771	30,816	7,447	15,936	9,528	10,242	Nil	599,760
Marathon Corp. (Oct. 31):								
1936	10,966	7,160	2,199	2,425	2,350	600	Nil	400,000
1939	14,307	7,186	3,499	4,512	3,597	1,199	28	399,134
1944	29,781	9,484	4,702	16,288	10,136	5,000	61	400,000
1945	31,280	15,689	6,442	11,067	10,071	5,000	66	400,000
Mead Corp. (Dec. 31):								
1936	29,752	20,665	3,720	4,326	7,240	3,315	1,023	619,374
1939	34,525	21,904	4,237	5,790	7,536	8,114	876	619,374
1944	37,387	19,756	5,616	9,586	6,000	7,983	153	693,610
f National Container Corp. (Dec. 31):								
1937	6,458	5,017	343	640	2,247	Nil	Nil	660,964
1939	6,787	5,188	416	709	2,343	Nil	7	660,964
1944	12,328	6,918	1,372	2,553	4,522	Nil	44	660,964
1945	15,180	8,274	2,361	4,192	4,260	2,212	54	676,330
Oxford Paper Co. (Dec. 31):								
1936	28,560	17,426	2,242	3,803	4,580	p 8,287	Nil	340,172
1939	28,833	16,919	2,603	4,273	4,490	p10,231	Nil	380,735
1944	27,607	14,836	3,257	6,351	1,890	p10,143	Nil	380,735
1945	28,413	14,415	5,370	8,158	1,700	p10,143	Nil	380,735
g Rayonier Inc. (a April 30):								
1937	21,435	17,378	2,161	1,248	425	15,655	Nil	963,872
1939	31,530	24,124	3,559	4,322	6,500	15,655	Nil	963,871
1943	30,433	22,330	3,822	5,000	3,427	15,655	Nil	963,871
1944	37,072	23,539	3,550	6,254	9,119	15,655	Nil	963,871
St. Regis Paper Co. (Dec. 31):								
1936	58,698	27,704	3,173	4,325	6,910	p4,428	915	4,120,714
1939	59,123	27,278	3,066	6,279	7,899	p4,428	874	4,120,714
1944	58,777	32,179	8,373	18,455	9,708	p7,372	3,345	4,120,714

(Table continued on next page)

Canadian Stock Market Trend

	Now	Sept. 1945	Sept. 1942
	$	$	$
Abitibi Common	8½	4¾	0.55
Abitibi 6% pref	99	64½	5
Bathurst A	20	10	11½
Consol Paper	17½	10	1⅝
Donnaconna A	17	12¾	2¼
Dryden	15	10¾	4
Fraser Cos.	55	43	7½
Howard Smith	31	23½	8½
Price Bros.	60	37	7
St. Lawrence A	34	26	9¾
St. Lawrence pf	93	65	24½

Canadian Bond Value Trend

	Now	Sept. 1945	Sept. 1942
Abitibi 5s	116	112½	57½
B. C. Pulp 6s	110	106	89
Brown 5s	106	101	76½
Can. Int. Pap. 6s	111	111	102½
Consol. 5½s	113	106½	62½
Donnaconna 4½s	107	102½	75
Dryden 6s	108	106½	101
Gt. Lakes	110	108½	95
Lk. St. John 5½s	105	102½	78

Outlook for British Paper Industry;

The British pulp and paper industry has its probems, too.

Writing in the "World's Paper Trade Review" of London, an editor who signs himself Donal, is very gloomy about the prospects of British paper—especially cellulose specialties, glassine, etc.—competing with the United States products.

He sees a great need for modernizing manufacturing methods in the British paper mills. But he mentions, ominously, the threat of high costs to try to satisfy political elements concerning smoke and river effluents from the mills.

North American operators will read these words with a feeling of considerable sympathy:

The Editorial

"With scarcity of paper still rather acute, one begins to wonder what the new priorities will be in order to set one's plans for full production. Judging from the Chancellor's budget speech, it appears to me that all exports will have first call on our raw materials, and after that building boards and wallpaper will come a close second. Much of our exported goods will require to be well wrapped in an attractive manner, much more so than the drab and austere methods which have been in use during the War. The cotton trade, in particular, knows a lot about the high class packing of its goods.

"In the past we did not have a great export market in garments so much as in cloth. As we shall require to put as many man-hours into our exports as is possible, probably we shall have some new problems to face in packing fine clothes. Much of the best of this type of

freight will be carried by air, so that light-weight, strong and secure packaging will be necessary. Cellulose wadding and glazed transparent papers will probably be the combination which will offer the cheapest and most attractive packing. There appears to be quite a future in these two commodities; but I am not at all sure that we shall be able to export them as such in face of the U. S. Government acceptance prices for paper bids. Their paper is only about half the price of ours.

"Yet it must be taken into consideration that our mills are not running at anything like full production, whilst theirs are. This makes a big difference; but it does not make a difference of anything like the 50% in price which is needed to carry us within competitive distance.

Need Better Machines

"Frankly, I do not see how we are going to shape out in the export markets of the world unless we can speed up our production enormously. I should say that our present machines are efficient, but not fast enough. They make tip-top paper, but not enough of it. Most of us expect to do quite a lot about this in the near future. But for the very high cost of papermaking machinery at present, I am sure that lots of us would be placing orders for it now. We are sorting out the essentials, but we do know that this will not take us far enough. If we can obtain the raw materials, I firmly believe that we can and will lead the world in quality production once more.

"A point of general interest which arises out of this matter, and one which will affect industry throughout the country, is that we must insist on getting our production machinery into first-class working order before we tackle any of the other problems which we shall have to meet as we can afford them.

"There is the smoke problem, for instance, which is largely due to our having to use inferior outcrop coal instead of that which we found was best for us to use in an efficient manner. There are many politically-minded people, who have no idea of the production of wealth and work for all, who think that this problem can be solved overnight. Nevertheless, we shall have government inspectors inspecting our chimneys. We shall also have government inspectors inspecting our trade effluents and industrial or fishing rivers.

"One or two of these items and social amenities can stand to one side for a year or two, to give poorer firms a chance to develop higher production first."

Paper Shortage in France

A sidelight on the paper situation in France was seen in a letter from Paris received by PULP & PAPER INDUSTRY. The writer, a French citizen, apologized for using a second sheet of paper, said the practice was to limit correspondence to one sheet.

Paper Industry in British Guiana?

Possibilities of establishing a paper pulp industry in British Guiana are to be explored, according to advices from Georgetown, the capital.

The colony possesses extensive Wallaba forests, which it has already been proved can be used for manufacturing paper pulp.

COMPARATIVE SALIENT BALANCE SHEET DATA (Cont.)

(In Thousands of Dollars)

Fiscal Year-end	Total Assets	*Net Fixed Assets	Inventories	Net Working Capital	Funded Debt, etc.	Preferred Stock	Minority Interests	†No. Com. Shares Outstanding
Scott Paper Co. (Dec. 31):								
1936	7,749	4,508	1,710	2,146	Nil	Nil	Nil	569,980
1939	20,230	9,219	2,380	5,575	702	6,034	Nil	667,956
1944	22,362	9,851	2,613	7,123	Nil	6,030	Nil	667,942
1945	25,976	11,566	5,979	7,760	Nil	6,030	Nil	804,782
Sutherland Paper Co. (Dec. 31):								
1936	4,826	2,728	924	1,558	Nil	Nil	Nil	287,000
1939	6,515	3,335	2,291	1,732	Nil	Nil	Nil	287,000
1944	7,996	4,078	2,012	2,788	Nil	Nil	Nil	287,000
1945	9,767	3,995	2,359	4,730	1,500	Nil	Nil	287,000
Union Bag & Paper Corp. (Dec. 31):								
1936	12,715	8,679	2,112	2,946	2,077	Nil	Nil	1,045,732
1939	20,244	14,813	2,397	4,116	4,997	Nil	Nil	1,262,730
1944	26,473	15,870	3,416	6,943	5,859	Nil	Nil	1,271,437
1945	22,425	12,841	3,474	7,301	2,946	Nil	Nil	1,271,437
West Virginia Pulp & Paper Co. Co. (Oct. 31):								
1936	56,437	32,855	5,530	12,027	4,000	15,524	Nil	902,660
1939	61,553	38,246	6,793	16,652	9,591	15,583	Nil	902,432
1944	59,345	29,665	6,761	15,136	Nil	15,281	Nil	902,432
1945	63,524	28,201	6,860	15,394	Nil	14,825	Nil	902,432
Columbia River Paper Mills (Dec. 31):								
1936	5,910	3,554	360	474	635	p680	Nil	20,000
1939	4,422	2,698	664	706	1,503	p200	Nil	20,000
1943	4,741	2,558	815	1,130	1,305	p77	Nil	20,000
1944	4,563	2,273	912	1,085	911	Nil	Nil	20,000
hMinnesota & Ontario Paper Co. (Dec. 31):								
1941	44,138	29,991	4,630	8,789	9,757	Nil	Nil	1,344,544
1944	45,180	27,338	5,801	10,982	6,310	Nil	Nil	1,344,543
Puget Sound Pulp & Timber Co. (Dec. 31):								
1937	7,146	4,841	393	350	23	2,473	Nil	251,837
1939	5,642	4,712	265	270	11	2,473	Nil	251,837
1944	10,097	4,444	726	1,027	488	1,121	Nil	326,918
Soundview Pulp Co. (Dec. 31):								
1936	7,431	5,848	576	448	900	293	Nil	418,500
1939	11,218	8,901	1,429	1,323	1,040	2,108	Nil	488,250
1944	12,619	7,860	1,442	1,656	Nil	2,108	Nil	488,250
Canadian—								
rAbitibi Power & Paper Co., Ltd. (Dec. 31):								
1936	121,956	68,599	3,073	2,241	50,485	p35,882	Nil	1,088,117
1939	121,679	65,139	5,895	10,773	50,895	p35,882	Nil	1,088,117
1943	130,324	46,638	7,645	25,532	71,343	p35,882	Nil	1,088,117
1944	127,504	44,120	8,347	24,260	66,629	p35,882	Nil	1,088,117
British Columbia Pulp & Paper Co., Ltd. (Dec. 31):								
1936	9,015	6,642	556	795	5,177	p556	Nil	100,000
1939	11,161	7,321	894	143	5,311	p556	Nil	100,000
1943	11,506	7,447	1,311	1,693	5,731	p556	Nil	100,000
1944	12,305	8,176	1,410	2,234	4,970	p556	Nil	100,000
1945	12,311	7,797	1,530	1,869	4,841	p556	Nil	100,000
Consolidated Paper Corp., Ltd. (Dec. 31):								
1936	67,925	56,615	5,840 d	725	52,096	Nil	Nil	2,308,789
1939	60,153	47,367	7,897	7,413	51,565	Nil	Nil	2,308,789
1944	63,782	28,898	12,666	25,812	43,847	Nil	Nil	2,562,702
Donnacona Paper Co., Ltd. (Dec. 31):								
1936	12,392	10,890	907	777	6,584	Nil	Nil	376,572
1939	14,029	11,615	1,257	1,341	7,263	Nil	Nil	376,572
1944	15,823	12,219	2,266	2,447	5,860	Nil	Nil	376,572
1945	16,958	12,925	2,458	2,209	5,860	Nil	Nil	376,572
Powell River Co., Ltd. (Dec. 31):								
1943	38,964	31,532	2,083	3,568	Nil	Nil	368	1,344,695
1944	40,537	31,603	2,186	5,377	Nil	Nil		1,344,695

*Does not include investments and/or interests in companies not consolidated. †Adjusted for split-ups.

a—In order to conform with data for other companies, fiscal years given are for period ending April 30th of year following: April 30, 1945, latest available. b—Reorganized in March, 1937. c—Reorganized in December, 1939. d—Organized (consolidation) in June, 1937. e—Organized in June, 1941; principal predecessor recapitalized in September, 1937. f—Organized in March, 1937. g—Organized (consolidation in November, 1937. h—Reorganized in February, 1941. r—In process of reorganization. p—Preferred stock dividends in arrears.

Funded debt includes deferred interest on bonds where such condition exists.

Note: The foregoing information has been obtained from sources believed to be reliable but is not guaranteed.

U. S.-Canadian production totals 21,965,000 tons in 1945—two-thirds of world output. Magazines and printers in scramble for available supply.

War's end, while it cut off the demand for certain types of "fighting" paper, stimulated a tremendous increase in demand for paper and paper products.

Most visible and dramatic of these developments was in the publishing industry. Publications began to execute plans held in abeyance during the war. Their hunt for additional tonnage of printing papers was often unavailing. So came the acquisition by large magazine and printing interests of their own paper mills to be a private source of supply. Although the newcomers to the industry showed commendable concern over wood and pulp supply on one hand and old customers on the other, in both theory and practice, such moves inevitably withdrew, or will soon withdraw, certain amounts of production from general paper sales. Four important paper mills in the Mid-West and two in the East have been purchased by magazine interests or by others who will supply them.

Expanded newspaper circulations and a heavy demand for advertising space created a tight situation in the newsprint field. This was further aggravated by the marked shifting of mills from newsprint to book and other grades. And yet despite this shift it appears that the total North American production of newsprint may this year exceed the records of 1937 and 1942.

A straw in the wind—U. S. paper output for March 1946 was 1,639,000 tons—biggest month since 1942. If that becomes average for the year, 1946 production in U. S. will reach 19,670,000 tons, about two million above 1941's record year.

The Printing Industry of America, Inc., published a statement that many of its members report a paper shortage more serious than that which brought about wartime regulations faces commercial printing. It said the demand for commercial printing is rapidly growing and al-

UNITED STATES

Paper and Woodpulp Production and Consumption (for paper only)
Consumption of Domestic and Imported Pulpwood and Total Pulpwood Consumption

Year—	PAPER		WOODPULP		CONSUMPTION OF PULPWOOD		
	Production (tons)	Consumption (tons)	Production (tons)	Consumption (tons)	Domestic (cords)	Imported (cords)	Total (cords)
1899	2,167,593	2,158,000	1,179,525	1,216,254	1,617,093	369,217	1,986,310
1904	3,106,696	3,049,824	1,921,768	2,091,006	2,477,099	573,618	3,050,717
1909	4,216,708	4,224,000	2,495,523	2,856,593	3,207,653	793,954	4,001,607
1914	5,270,047	5,496,164	2,893,150	3,556,377	3,641,063	829,700	4,470,763
1917	5,919,647	6,255,725	3,509,939	4,148,600	4,706,327	773,748	5,480,075
1918	6,051,523	6,387,066	3,313,861	3,869,746	4,506,276	744,518	5,250,794
1919	6,190,361	6,479,490	3,517,952	4,113,911	4,445,817	1,032,015	5,477,832
1920	7,334,614	7,846,827	3,821,704	4,696,035	5,014,513	1,099,559	6,114,072
1921	5,356,317	6,053,915	2,875,601	3,544,218	3,740,406	816,773	4,557,179
1922	7,017,800	8,007,088	3,521,644	4,756,105	4,498,808	1,050,034	5,548,842
1923	8,029,482	9,339,573	3,788,672	5,149,695	4,636,789	1,236,081	5,872,870
1924	———	———	3,723,266	5,216,265	4,720,191	1,047,891	5,768,082
1925	9,182,204	10,590,090	3,962,217	5,590,304	5,005,445	1,088,376	6,093,821
1926	———	———	4,394,766	6,096,279	5,489,517	1,276,490	6,766,007
1927	10,002,070	11,915,233	4,313,403	5,960,865	5,526,889	1,224,046	6,750,935
1928	10,403,338	12,447,841	4,510,800	6,239,641	5,750,689	1,409,411	7,160,100
1929	11,140,235	13,347,925	4,862,885	6,704,341	6,411,566	1,233,445	7,645,011
1930	10,169,140	12,314,819	4,630,308	6,463,185	6,089,852	1,105,672	7,195,524
1931	9,381,840	11,403,850	4,409,344	6,005,718	5,896,446	826,320	6,722,766
1932	7,997,872	9,733,764	3,760,267	5,083,446	4,891,424	741,699	5,633,123
1933	9,190,017	10,919,391	4,293,344	6,027,088	5,933,295	628,379	6,561,674
1934	9,186,266	11,185,682	4,281,428	5,969,633	5,822,681	973,978	6,796,659
1935	10,506,195	12,490,886	4,944,226	6,877,869	6,590,942	1,037,332	7,628,274
1936	11,670,000	14,546,046	5,695,219	7,420,829	7,506,156	1,209,760	8,715,916
1937	12,600,000	15,798,362	6,617,184	8,692,489	8,870,932	1,522,868	10,393,800
1938	11,327,000	13,488,300	5,933,060	7,975,000	7,900,053	1,293,938	9,193,991
1939	13,509,642	15,930,349	6,993,334	9,058,415	9,685,592	1,130,874	10,816,466
1940	14,483,709	16,620,632	8,851,740	9,724,643	12,564,180	1,435,820	13,742,958
1941	17,762,365	20,391,412	9,978,400	10,801,223	15,400,000	1,292,640†	16,692,640
1942	17,083,862	19,608,862	10,233,000	11,050,000	15,972,000	1,232,000	17,204,000
1943	17,035,688	19,560,688	9,070,157	10,515,743	15,000,000	1,718,000	16,718,000
1944	17,182,804	19,485,887	10,108,443	10,502,204	14,819,000	1,650,000	16,469,000
1945	17,374,208	19,822,453	10,165,000	10,823,000	15,315,000	1,699,000	17,014,000

Source: Bureau of the Census, United States Forest Service and A. P. & P. A. Bureau Foreign and Domestic Commerce, U. S. Pulp Producers Association.

†Available for nine months of 1941 only. Other 1941 figures estimated for 12 months.

Note: Pulp consumption for all purposes—paper, rayon, plastics, etc.—was 11,362,600 tons in 1945 and 11,066,204 tons in 1944.

STATES WHICH LED U. S. IN VARIOUS TYPES OF PAPER PRODUCTION

What states are leading U. S. producers in different types of paper?

That's a toughy to figure out on the basis of the government's most recent figures, because production of many states were combined in the statistics. In some cases, the combinations of states seem to be made rather arbitrarily. For instance, Texas is combined with Washington and Oregon in the newsprint figures, presumably on the basis that they were the only "western" producers. All the newsprint was made in just 8 states and of this number, there just were 5 important producers.

It is evident in some of the other grades of papers listed below, that the real "leader" may not be a group of states in first place, but a single state which had to be listed in second place.

Here's the best we can do in listing the 1945 "winnahs" with their total tonnages for the year, which disclose interesting "state vs. state" comparisons:

Newsprint

1st—Maine—New York—450,654.
2nd—Washington—Oregon—Texas—242,369.
3rd—Minnesota—Mich.—Wisconsin—32,452.

Groundwood Printing

1st—New York—213,682.
2nd—Maine—177,812.
3rd—Washington—Oregon—Minn.—115,844.

Book Paper

1st—Wisconsin—Minnesota—274,966.
2nd—Pennsylvania—231,260.
3rd—Ohio—220,502.
4th—Maine—New Hampshire—180,330.
5th—New York—New Jersey—148,827.

Fine Papers

1st—Massachusetts—Connecticut—169,922.
2nd—Wisconsin—Minnesota—157,133.
3rd—New Jersey—Pennsylvania—117,857.
4th—Maine—88,954.
5th—Wn.—Ore.—Calif.—Tenn.—Ala.—Miss.—La.—71,392.

Wrapping Paper

1st—Alabama—Miss.—Arkansas—355,171.
2nd—Wisconsin—Minnesota—280,988.
3rd—Louisiana—Texas—222,821.
4th—No. Carolina—Georgia—Fla.—204,034.
5th—Washington—California—156,609.
6th—Michigan—109,260.

Shipping Sack

1st—N. Y.—N. J.—Penn.—Me.—N. H.—Vt.—Mass.—109,114.
2nd—Ala.—Ark.—Louisiana—Tex.—98,874.
3rd—Va.—W.Va.—N. C.—Ga.—Fla.—96,287.
4th—Washington—Oregon—61,110.
5th—Ohio—35,086.

Industrial Paper

1st—Maine—New Hamp.—Vermont—67,972.
2nd—Wash.—Ore.—Ala.—Ark.—La.—43,518.
3rd—New York—29,025.
4th—New Jersey—Pennsylvania—27,790.
5th—Massachusetts—24,681.
6th—Ohio—Indiana—Michigan—18,030.

Sanitary Paper

1st—Wisconsin—Minnesota—229,674.
2nd—Pennsylvania—191,833.
3rd—New York—182,318.
4th—Wn.—Ore.—Calif.—Del.—Ark.—83,551.
5th—Maine—New Hampshire—81,759.
6th—Vermont—Massachusetts—26,111.

Tissue Paper

1st—Wash.—Ore.—Calif.—Miss.—41,636.
2nd—New York—35,983.
3rd—Wisconsin—30,303.
4th—Ohio—Michigan—23,072.

Absorbent Paper

1st—Va.—No. Carolina—Del.—D.C.—21,525.
2nd—New York—12,678.
3rd—New Jersey—Pennsylvania—11,115.
4th—Massachusetts—Connecticut—10,016.

Building Papers

1st—New Jersey—170,451.
2nd—Washington—California—90,659.
3rd—Md.—Va.—Ga.—Tenn.—La.—Texas—123,929.
4th—Rhode Island—Conn.—N. Y.—116,786.
5th—Ohio—Indiana—91,366.

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ready is perhaps 30% over highest wartime demand.

The U. S. Government printing office is so alarmed over inability to get bids on paper needs that it has announced through its chief that it is considering purchase of its own paper mill.

Total U. S.-Canada-Newfoundland Production

The total production of paper and paperboard by the United States, Canada and Newfoundland during 1945 was about 21,965,000 tons, more than two-thirds of the production of the entire world (total for the world was about 30,000,000 tons).

This total figure for U. S. and Canada includes the production of 17,374,208 tons in the United States, according to the U. S. Census Bureau, and estimated productions of 4,250,000 tons in Canada, and 340,000 tons in Newfoundland. (The Canadian Newsprint Association announced 3,259,000 tons of newsprint was produced in the Dominion and to this we have added 1,000,000 tons, assuming that Canada produced about as much of other paper in 1945 as it did in 1944.)

The total for these three great paper countries is, therefore, about 465,000 tons above 1944 figures and only about 670,000 tons less than the record high productive year of 1941. In fact, 1945 for the U. S., Canada and Newfoundland combined was the greatest producing year in their entire papermaking history except for 1941, despite the fact that war time restrictions and

TOTAL PAPER PRODUCTION IN UNITED STATES

(Tons of 2,000 lbs.)

	1940	1941	1942	1943	1944	1945
Newsprint	1,056,304	1,043,999	967,211	811,309	720,752	725,267
Book	1,655,423	2,025,851	1,704,029	1,592,878	1,435,785	1,494,436
Groundwood	550,453	642,676	610,168	585,673	593,094	636,506
Fine	735,753	950,014	1,055,475	1,020,601	974,372	1,010,064
Wrapping (Coarse)	2,500,818	2,778,441	2,713,738	2,501,637	2,559,447	2,642,721
Tissue	733,894	175,336	170,653	162,766	157,540	157,384
Sanitary	.....	737,538	811,343	806,023	807,893	823,889
Absorbent	129,410	61,941	64,530	88,254	90,107	88,849
Building Papers	682,460	917,912	1,001,383	877,582	881,246	889,464
Other Paper	60,120	28,657	16,148	129	.....	.....
Container Board	3,434,834	4,183,846	3,755,438	4,087,972	4,228,304	4,130,424
Folding Boxboard	1,416,452	1,841,916	1,711,795	2,015,640	2,116,152	2,266,861
Setup Boxboard	898,549	1,238,850	996,688	829,102	750,313	718,972
Tube Stock	.....	.....	164,785	307,308	458,107	361,034
Building Boards	179,443	761,480	1,052,054	1,063,851	1,087,467	1,121,824
Other Boards	449,796	373,868	288,424	284,963	322,225	306,513
TOTAL	14,483,709	17,762,365	17,083,862	17,035,688	17,182,804	17,374,208

Source: 1940-1945: Bureau of Census, U. S. Department of Commerce.

UNITED STATES PAPER PRODUCTION, IMPORTS, EXPORTS, AND CONSUMPTION

(Quantities in Tons of 2,000 Pounds)

TOTAL — ALL GRADES

Year	Production	Imports	Exports	Consumption Tons	Consumption Lbs. Capita
1899	2,167,593	.....	.....	2,167,593	57.9
1904	3,106,696	.....	77,704	3,028,992	73.3
1909	4,121,495	55,962	74,764	4,102,693	90.5
1914	5,152,705	349,278	106,713	5,395,270	110.2
1919	5,966,076	707,548	420,540	6,253,084	119.1
1924	7,929,985	1,500,433	149,541	9,280,877	164.0
1925	9,001,742	1,567,121	152,351	10,416,512	181.4
1926	9,794,086	1,973,451	183,130	11,584,407	198.8
1927	10,002,070	2,107,344	184,226	11,925,188	201.8
1928	10,403,338	2,266,828	218,730	12,451,436	207.8
1929	11,140,235	2,533,603	262,383	13,411,455	220.7
1930	10,169,140	2,365,272	215,811	12,318,601	200.7
1931	9,381,840	2,136,079	170,891	11,347,028	182.8
1932	7,997,872	1,848,016	119,292	9,726,596	155.6
1933	9,190,017	1,852,420	126,854	10,915,583	173.6
1934	9,186,598	2,265,281	163,199	11,288,680	178.3
1935	10,479,095	2,456,998	178,370	12,757,723	200.1
1936	11,975,552	2,855,153	179,727	14,650,978	228.1
1937	12,837,003	3,435,222	232,361	16,039,864	248.2
1938	11,380,814	2,357,477	208,064	13,530,227	207.8
1939	13,509,642	2,702,952	266,070	15,946,515	243.4
1940	14,483,709	2,826,880	578,248	16,732,341	254.2
1941	17,762,365	3,120,213	494,911	20,387,667	308.9
1942	17,083,862	3,046,207	390,837	19,739,132	296.8
1943	17,035,688	2,762,429	347,864	19,450,253	286.8
1944	17,182,804	2,616,000	312,917	19,485,887	286.6
1945	17,374,208	2,775,000	326,755	19,822,453	283.9

Source: American Paper & Pulp Assn.

wood and labor shortages were still holding them both back.

Here are comparisons for recent years:

Total Paper Production of U. S., Canada and Newfoundland

Year	*Tons*
1945	21,965,000
1944	21,499,980
1943	21,252,032
1942	21,590,629
1941	22,637,141
1940	19,153,123
1939	17,410,144

The wartime record and the 1945 record are astonishing accomplishments in view of the fact that in all papermaking regions north of the Rio Grande, the industry has done this with less of almost everything it takes to make paper.

Even now, with new equipment and expansion programs delayed by belated deliveries and with a continuing acute woods labor situation, the U. S. paper mills had pushed their ratio of production to mill capacity to new high marks. Their rate was 103 and 104% in the first weeks of March. This was according to the American Paper & Pulp Association's method of reckoning and compares with yearly averages of 97.4% in the 1941 and only 87.8% in 1943 and 83.4% in 1939. The March rate in 1945 was 90%.

Paper production in the U. S. alone in 1945 was less than 300,000 tons below the all-time high of 1941. Paper consumption also was just about 500,000 tons under all-time United States record of nearly 20,400,000 tons in 1941.

Production of paper in the U. S.- as differentiated from paperboard— was 8,468,580 tons in 1945 as compared with 8,220,000 tons in 1944. In this is included newsprint, dealt with in a later chapter, which remained far below pre-war levels. Groundwood printing, book, fine, coarse wrapping, multiwall sack and sanitary paper grades showed substantial increases over 1944 while tissue continued strong in its newfound much wider field.

The end of the war in Japan and substantial imports of pulp from Sweden had its effect in stimulating paper production during the last three months of 1945. The industry, as often pointed out, had no reconversion problem and in contrast to other industries, has been practically free of production-impeding strikes. But modernization of the mills awaits equipment from other hard-hit or reconverting industries.

More than 600,000 tons of Swedish pulp, mostly unbleached sulfite and unbleached kraft, were landed at Atlantic ports for distribution at the paper mills during the latter part of 1945, beginning June 25 with the first postwar shipment. This tonnage came from large inventories accumulated by Swedish mills during the war years.

Book Paper Field

Production of book paper in 1945 totaled 1,494,436 tons as compared with 1,435,785 tons in 1944. Gains in production in 1945 over 1944 were registered in machine-finished, supercalendered, machine coated, offset, and label and wrap papers. Body stock for coated paper declined slightly as did the production of envelope and tablet papers.

Production of book paper for 1945 averaged about 84% of standard capacity, according to the records of the Book Paper Manufacturers Association. During the fourth quarter of 1945, however, production was at the rate of 96% of standard capacity.

One customer about which little

46-Year Record (Selected Years)
United States Paper Production, Imports Exports, and Consumption

(Quantities in Tons of 2,000 Pounds)

Year—	Production	Imports	Exports	Consumption Tons	Consumption Lbs., Capita	Year—	Production	Imports	Exports	Consumption Tons	Consumption Lbs., Capita
Newsprint											
1899	569,212			569,212	15.2	1934	989,705	2,209,698	23,405	3,175,998	50.2
1904	912,822		52,159	860,663	20.8	1939	954,259	2,615,129	13,495	3,555,893	54.2
1909	1,168,098		48,740	1,119,358	24.7	1941	1,043,999	2,982,375	70,265	3,956,109	59.9
1914	1,313,284	278,403	44,483	1,547,204	31.6	1942	967,211	2,921,207	41,595	3,846,823	57.8
1919	1,323,880	627,734	110,268	1,841,346	35.1	1943	811,309	2,637,429	35,256	3,413,482	50.3
1924	1,481,425	1,357,233	17,159	2,821,499	49.8	1944	720,752	2,491,000	31,000	3,180,590	46.8
1929	1,409,169	2,422,700	18,695	3,813,174	62.8	1945	725,267	2,650,000	45,000	3,330,267	47.7
Books											
1899	304,459			304,459	8.1	1934	1,055,247	4,730	12,066	1,047,911	16.6
1904	454,337			454,337	11.0	1939	1,546,930	13,749	22,463	1,538,216	23.4
1909	582,114	1,104		583,218	12.9	1941	2,025,891	28,506	51,752	2,002,645	30.4
1914	795,958	6,489	14,301	788,146	16.1	1942	1,704,029	28,245	56,954	1,675,075	25.2
1919	828,641	146	76,691	752,096	14.3	1943	1,592,878	28,000	31,566	1,589,312	23.4
1924	1,050,000	14,328	10,970	1,053,358	18.6	1944	1,435,785	28,000	38,467	1,425,318	21.1
1929	1,497,912	3,406	27,567	1,473,751	23.9	1945	1,494,436	28,000	38,467	1,483,969	21.3
Fine Papers											
1899	131,456			131,456	3.5	1934	434,870	879	10,263	425,486	6.7
1904	168,982			168,982	4.1	1939	613,995	573	20,498	594,070	9.0
1909	215,791			215,791	4.7	1941	950,014	159	46,783	903,390	13.7
1914	269,407		3,369	266,038	5.4	1942	1,055,475	993	38,430	1,008,775	15.2
1919	347,346		37,680	309,666	5.9	1943	1,020,601	300	58,525	962,376	14.4
1924	422,000	1,373	4,040	419,333	7.4	1944	974,372	300	68,367	906,305	13.3
1929	635,662	1,613	16,660	620,615	10.2	1945	1,010,064	300	68,367	941,997	13.5
Wrapping and Bag											
1899	535,252			535,252	14.3	1934	1,356,115	5,124	32,160	1,329,079	21.0
1904	644,291			644,291	15.6	1939	2,238,993	14,954	41,014	2,212,933	33.8
1909	763,067			763,067	16.8	1941	2,778,441	4,490	90,357	2,692,574	40.8
1914	911,029	18.258	7,067	922,220	18.8	1942	2,713,738	9,943	52,178	2,665,360	40.0
1919	858,464	2,401	49,408	811,457	15.5	1943	2,470,039	3,800	54,999	2,418,840	35.7
1924	1,235,000	25,540	18,520	1,242,020	21.9	1944	2,559,447	3,800	49,560	2,513,687	36.9
1929	1,605,783	9,344	29,425	1,585,702	26.1	1945	2,642,721	3,800	49,560	2,596,961	37.2
Tissue											
1899	28,406			28,406	0.7	1934	397,196	8,687	7,281	398,602	6.3
1904	43,925			43,925	1.1	1939	665,723	9,347	14,695	660,375	10.1
1909	77,745			77,745	1.7	1941	912,874	2,661	26,500	889,035	13.5
1914	115,401			115,401	2.4	1942	981,996	507	15,125	963,258	14.5
1919	190,561	245		190,806	3.6	1943	968,789	2,900	23,210	948,479	14.0
1924	242,000	6,795	4,368	244,427	4.3	1944	965,433	2,900	18,923	949,410	14.0
1929	387,811	10,527	7,725	390,613	6.4	1945	981,273	2,900	18,923	965,250	13.1
Paperboard											
1899	394,111			394,111	10.5	1934	4,073,261	20,936	51,159	4,043,038	63.9
1904	559,711			559,711	13.6	1939	6,104,968	28,610	103,384	6,030,194	92.1
1909	883,088			883,088	19.5	1941	8,399,960	36,882	141,250	8,293,592	125.7
1914	1,291,805			1,291,805	26.4	1942	7,969,184	36,000	127,309	7,877,875	118.5
1919	1,867,064	44,461	61,890	1,849,635	35.2	1943	8,620,434	36,000	89,705	8,566,729	126.4
1924	2,850,000	55,275	48,661	2,856,614	25.5	1944	8,962,568	36,000	82,018	8,916,550	131.1
1929	4,451,187	42,351	94,374	4,399,164	72.4	1945	8,905,628	36,000	82,018	8,859,610	126.9

Source: American Paper and Pulp Assn.

is heard, but which uses huge amounts of book paper of the finest kind, is the direct-by-mail advertising industry. Magazine advertising men—direct competitors in the general advertising field—like to say that the waste baskets of the nation are literally overflowing with direct mail advertising. Whatever the merits of either method, there are more to come.

Book publishers especially look on the huge amounts of paper for direct-by-mail advertising with jaundiced eyes. For years the relationships between old paper mills and old book publishers have been a matter of tradition and sentiment. These relationships spread over 50 and sometimes 75 or 100 years. Not until recently have book publshers, because of their long standing in the customer field, begun to receive polite indications that they must cut down. With book sales wild and growing wilder, it is a bitter pill.

"And what of text books?" one publisher asked PULP & PAPER INDUSTRY pointedly. "We are going to educate 1,000,000 G. I.s—and that means tens of million of new text books alone. Does the Army think we can produce them overnight with the paper situation as it is?" The answer is, of course, that the Army has not even thought about that angle—yet. What will happen when it does is food for thought.

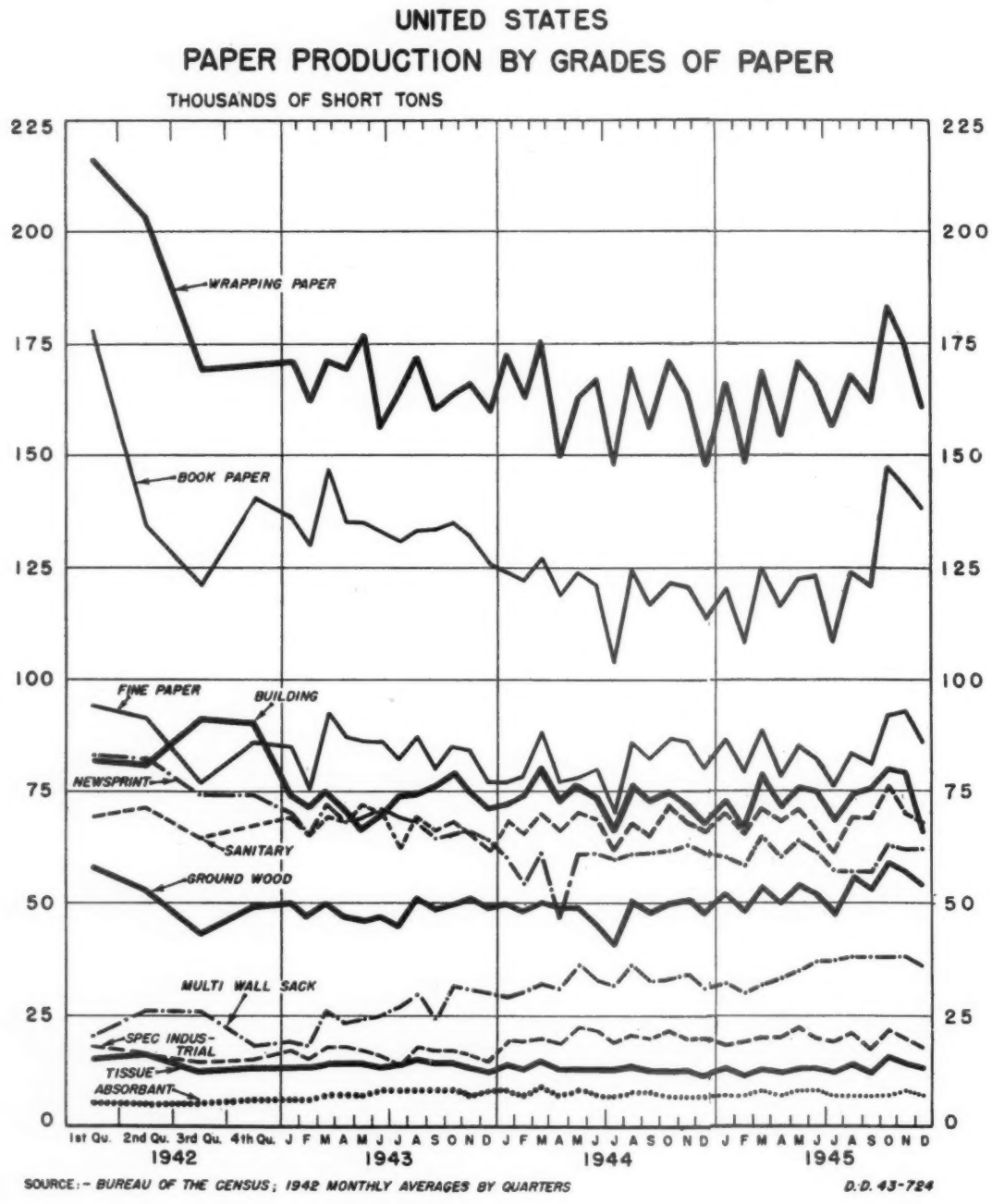
Magazine Paper Demand

In its recent regular issues,

PULP & PAPER INDUSTRY has been keeping close tab on the race for magazine paper. The trend is still up in 1946, despite the fact that "cats and dogs"—mainly in the comics and pocket digest fields—are beginning to feel the pinch of competition on the newsstands. There is also some relief in the fact that several would-be publishers with a "dummy" and backing have decided not to take the plunge. The tank looks full, and more than one has climbed back down the ladder and put on the shirt he wants to keep.

But, to repeat, the trend is up for the well entrenched publications. Last month *True Story,* for example, reached a new high—1,900,000 on newsstand sales alone. Subscription sales bring the total to 2,500,000. Soon to appear on the stands will be scores of new "one-shot" titles, mostly magazines telling how to do this or that. Pocket books (Pocket, Bantam, many another) are still on the up curve, and one of the leaders will spend $300,000 in advertising this year and add a new series of "King Size" models (9 by 13 inches) to sell at a dollar. *Holiday,* the big Curtis travel magazine, has its first issue out, and in Independence Square they are still working toward a picture magazine as well.

The biggest headache in the magazine publishing picture—aside from paper—is the lack of display space and the shortage of trucks. Magazine sales are higher than ever (more returns, but also more copies being printed) but "where are we



going to put the new ones?" is the desperate cry of every wholesaler, distributor and man at the corner kiosk.

At least 200 new magazines were listed to be born during 1946, and the old standbys were counting on many new readers. Life expects 5,000,000 readers by October and Time-Life, Inc., will get more paper during the next 18 months from Crown Zellerbach Corp., St. Regis, Watab and Hennepin mills in Minnesota, Consolidated Water Power & Paper, International, Bryant and, eventually, Maine Seaboard and others.

A 5,000,000 circulation for the Post is also foreseen this year and it has new sources of supply coming up at Crown Zellerbach Corp. and New York-Penn Co. Cuneo Press, important printer of magazines, has bought Combined Locks Paper Co.

Crowell-Collier is seeking more paper by contracts instead of purchase or acquisition of mills, but it, too, has big plans.

According to the National Publishers Association, 74% of all magazines are still on a wartime basis as to paper weight and size of format, and in this connection it is pointed out that 89% of magazines reduced the basic weight of paper. Most of this 89% expect to use better than prewar weight, according to NPA. About one-third of 723 publishers who answered a survey expect to eventually run more pages than before the war.

Upswing in Tissue

The tissue and sanitary figures for 1945 show an increase over the previous year—981,273 tons as against 965,433 tons in 1944. Both figures are remarkable, considering all the factors. Tissue had many Number One uses in the war, as indicated by the fact that tissue mills often received priorities on both pulp and chemical supplies. Nevertheless, the great user of tissue is a civilized nation at peace, not at war.

The tremendous growth of tissue production in peace years is the evidence. In its first recorded year, tissue production was 28,406 tons. A year after World War I it was 190,561 tons. But the big growth came in the late Thirties and early Forties. The great hold that facial tissue, for instance, has on the woman's market was dramatically illustrated when queues formed to buy reduced stocks at retail stores. As a "must," tissue is right up there with nylons and cigarets in the public mind. Three mills on the Pacific Coast are going to make dry creped tissues for the first time.

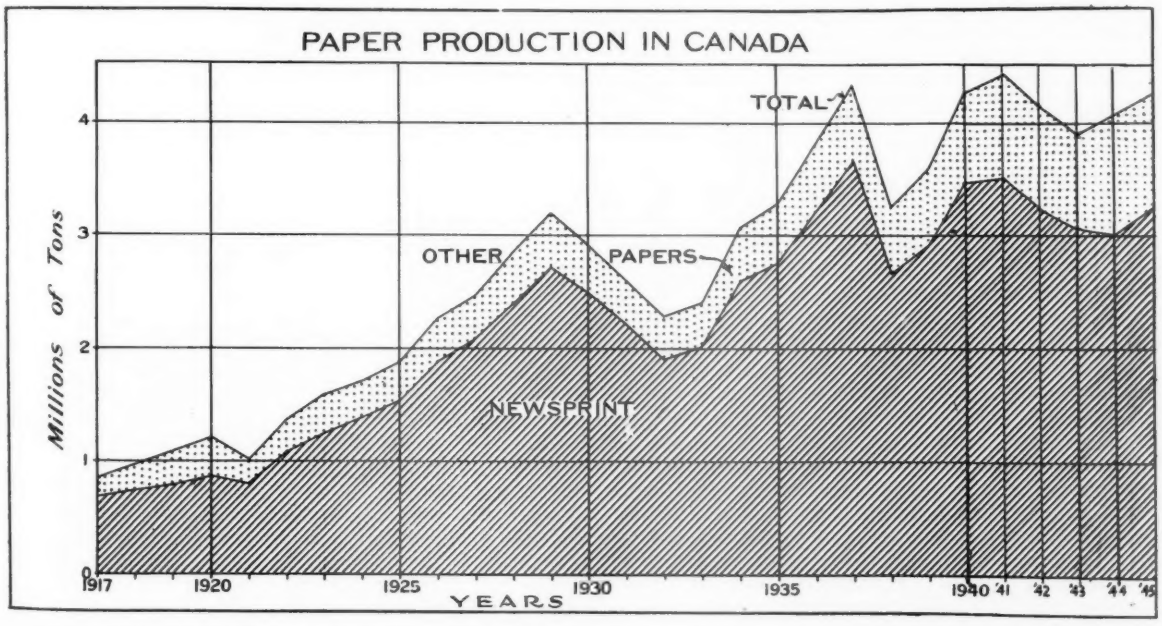
Tonnage of any mill is not comparatively great, but it is notable that three Pacific Coast mills are planning to make dry creped tissue for the first time in the far west. Other machines are going in at Memphis, Chicago, in New Jersey, Wisconsin and New York localities.

Here is a breakdown of tissue production which is given by years in another table on these pages:

CANADIAN PAPER PRODUCTION (Selected Years)

	Newsprint		Total Paper	
	Tons	$ Value	Tons	$ Value
1917	689,847	38,868,084	853,689	58,750,341
1922	1,081,364	75,971,327	1,366,815	106,260,078
1929	2,725,331	150,800,157	3,197,149	192,989,252
1932	1,919,205	85,539,852	2,299,767	114,115,570
1939	2,926,597	120,858,583	3,600,502	170,776,062
1940	3,503,801	158,447,311	4,319,414	225,836,809
1941	3,519,733	158,925,310	4,524,776	241,450,292
1942	3,257,180	147,074,109	4,231,767	230,269,512
1943	3,046,442	154,290,163	3,966,344	235,362,958
1944	3,039,783	165,655,165	4,044,376	255,545,841
1945*	3,259,000	.....	4,250,000	.....

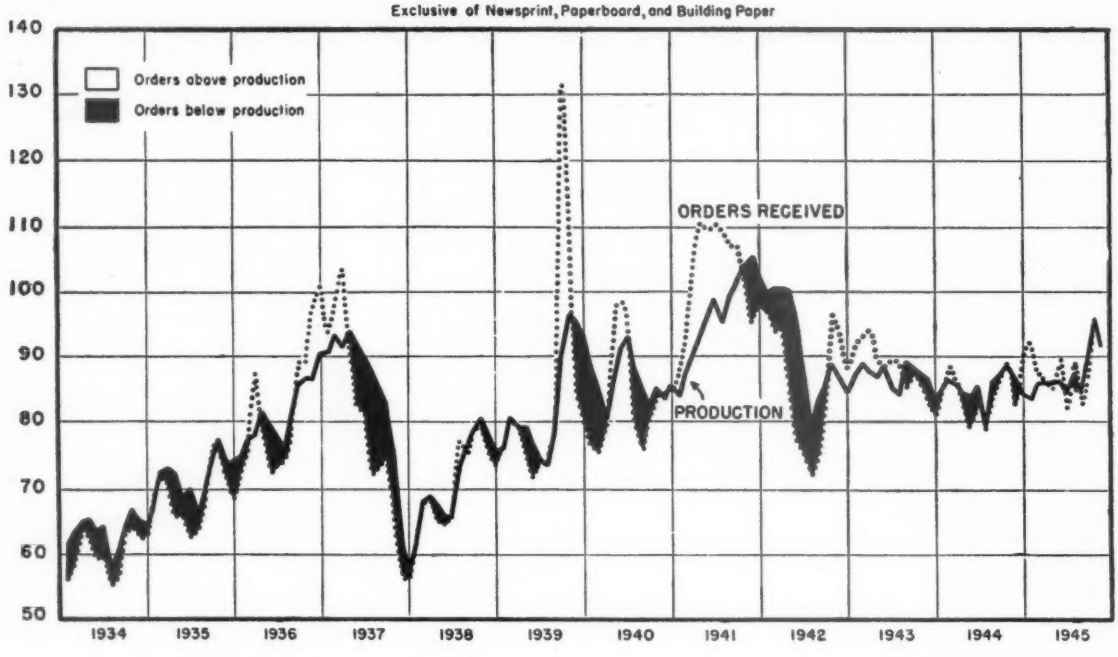
Dominion Bureau of Statistics.
*1945 figures from News Print Service Bureau; include estimate for total paper.



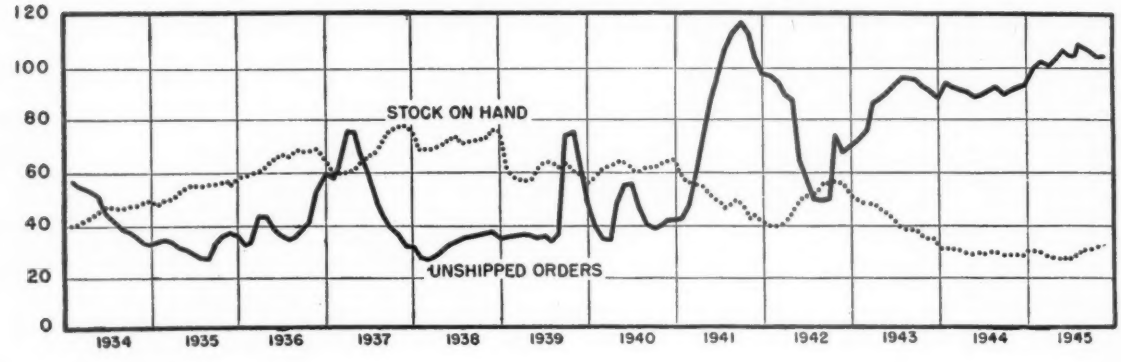
CANADIAN PAPER PRODUCTION figures for latest available years, officially, were: Total paper—4,044,376 in 1944, 3,882,262 tons in 1943, 4,164,565 in 1942 and 4,449,598 in 1941. Total newsprint—3,039,783 in 1944, and probably was approximately as much again last year. Unofficial figures for 1945 showed total paper production increased to about 4,250,000 tons. The News Print Service Bureau's estimate of Canadian newsprint production as 3,259,000 tons in 1945 would indicate a total Canadian paper output of about 4,250,000 tons, based on the fact that paper production was about 1,000,000 tons more than newsprint in 1944, and probably was approximately as much again last year.

PAPER PRODUCTION AND NEW ORDERS EXPRESSED AS PER CENT OF CAPACITY

Exclusive of Newsprint, Paperboard, and Building Paper



UNSHIPPED ORDERS AND STOCK ON HAND AT MILLS EXPRESSED AS PER CENT OF CAPACITY



SANITARY AND TISSUE PAPER

(Tons of 2,000 Pounds)

Grade	*Quantity*
Sanitary, total	*823,704*
Napkin, wadding	41,467
Toweling stock	204,605
Toilet tissue	416,207
Napkin stock	75,557
Facial tissue	80,333
Other sanitary	5,535
Tissue paper, total	*157,083*
Waxing stock	50,194
Wrapping	37,216
Pattern	4,378
Twisting stock	12,192
Fruit-vegetable wrap	34,284
Crepe wadding	9,068
Other	9,751

In the paper mill laboratories throughout the industry, new grades are being developed for particular uses; paper made from hardwood pulp; papers highly resistant to humidity changes; wrappings that are transparent but at the same time resistant to ultra-violet light; lacquered papers, extremely moisture-resistant; a resin-impregnated paper plastic of high strength—in laminated form its uses are many and varied.

Truly, the paper mill industry is looking forward. New markets for paper products are being discovered. Many new uses for paper have come out of war necessity. Paper and paper products now enjoy a popularity long deserved.

Foreign Trade

An effort is being made by government authorities to build up international trade and this will involve the pulp and paper industry. An indication of this effort was in a discussion of the subject which was given prime position in the review of paper industry by the U. S. Office of Domestic Commerce.

It said, in part:

"Of the important pulp and paper producing countries in the world before the war, only the U. S., Canada and Newfoundland and Sweden escaped serious war damage. Presumably, these countries are now in a position to resume international trade. All other important world trade suppliers—Finland, Germany,

Bear Brand Chemicals for Western Paper Industry

The dependability of Bear Brand Chemicals and their ready availability make them the choice of many of the West Coast's largest paper mills.

Ammonia Chlorine

Caustic Soda

Sulphur Dioxide

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

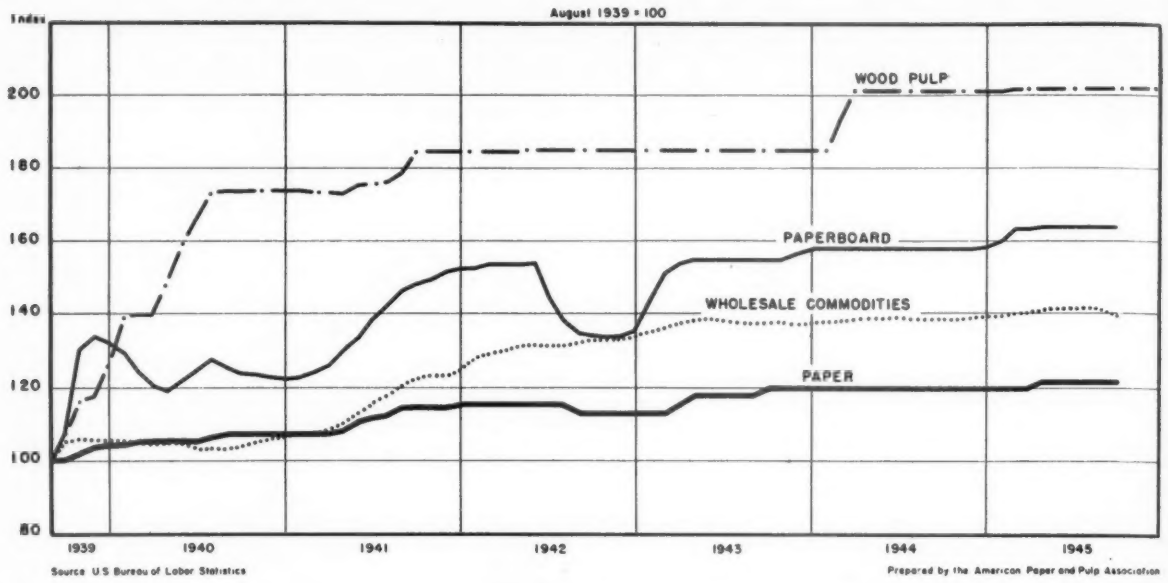
GREAT WESTERN DIVISION

THE DOW CHEMICAL COMPANY

SAN FRANCISCO, CALIFORNIA

Seattle Los Angeles

INDEX OF PULP AND PAPER PRICES RELATED TO WHOLESALE COMMODITY PRICES



Netherlands, Norway, the United Kingdom and Japan, all exporting more than 100,000 tons in 1937—are not now ready to enter world trade; nor, with the exception of Norway and Finland, are they making much progress toward that end.

"Importing countries must depend upon North America and Sweden for the bulk of their paper requirements in 1946 and to a considerable extent probably for some years to come. There is abundant evidence to indicate that the present exporting countries other than the U. S. are planning to expand shipments of paper in world markets, and to do this as speedily as possible, before France, Germany, Japan, The Netherlands, Finland, and Norway can reorganize their production.

"There is also evidence that to the extent to which these present exporters shift their exports from wood pulp to paper, the supply of wood pulp to the United States is bound to be affected. The alternative is that the United States also enter the international paper trade in a serious manner and in time to establish a commanding position before commitments between importing and exporting countries are completely formed.

SWEDEN'S PAPER EXPORTS

(In Short Tons)

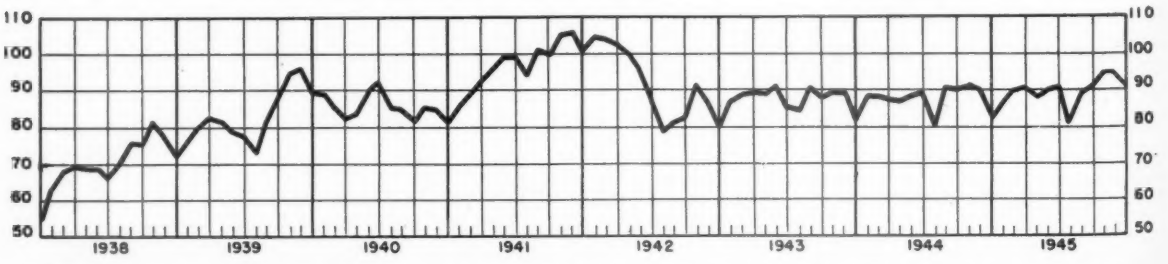
	1945	*1944*
Total paper and paperboard	230,420	191,120
Newsprint	77,546	75,379
Enameled paper	439	438
Wrapping paper	92,323	82,402
" kraft	52,923	69,617
" sulfite	29,170	7,460
Parchment glassine and greaseproof	9,394	3,987
Book, writing, tissue and other quality grades	36,218	29,014
Board	14,500	7,883

Source—Svensk Pappers Tidning.

"Current activities of the United Nations Organization and plans for establishing an International Trade Organization to discuss ways and means of stimulating world trade are significant in the light of the new trade opportunities. Last December the Department of State sent invitations to 14 countries to participate in negotiations for the reduction of trade barriers. So far 13 countries have replied favorably but as yet no word has been received from the U.S.S.R. This meeting, to be held this spring, will be preparatory to a proposed world trade conference in the summer at which the International Trade Organization will be formally proposed to members of the UNO. The United States pulp and paper industry has an important interest in these activities.

"Currently and for some time ahead, the strong demand for pulp and paper has placed most manufacturers in the position of allocat-

MONTHLY RATIO OF PAPER PRODUCTION TO CAPACITY



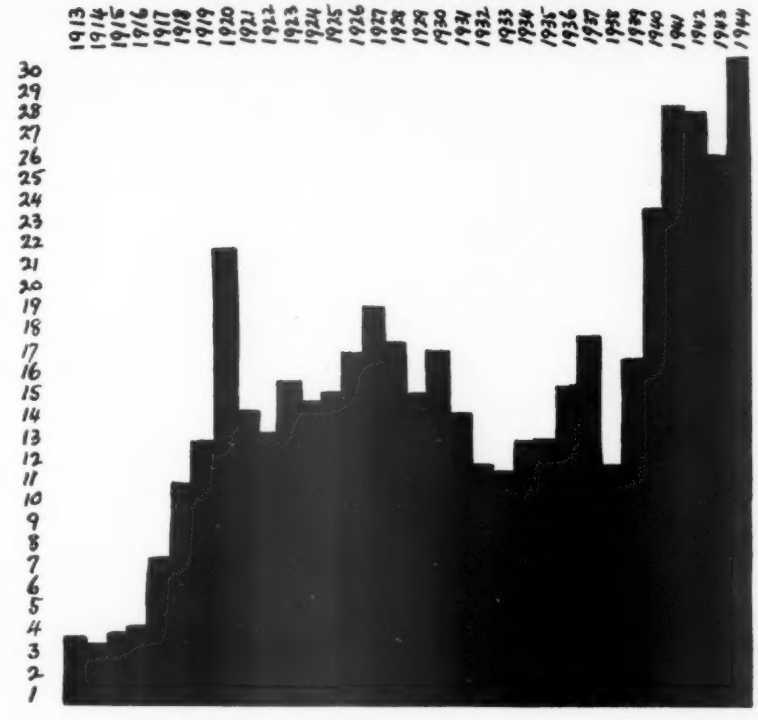
*** Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.**

ing supplies to their regular domestic customers. Exporters report difficulty in obtaining coverage of foreign orders. This is a normal American reaction during periods when the domestic market is strong. But it overlooks the long range possibilities under conditions which in the future appear much brighter than in the past.

"The U. S. has ranked for several decades as the world's largest consumer of wood pulp and paper. It has also been the largest producer, making annually over 40% of the world's output of pulp and well over 50% of the world's ouput of paper and paperboard. Yet the United States has remained a comparatively minor factor in world export trade. It is, rather, the world's greatest importer of papermaking materials and of newsprint. The possibility that within a short time current expansion programs will carry overall capacity beyond requirements, suggests that an active export trade would provide an important market potential."

VALUE OF BRITISH COLUMBIA PULP-PAPER PRODUCTION

(Figures in left hand column are millions of dollars)



BRITISH COLUMBIA PULP AND PAPER AND ALL FOREST PRODUCTS ESTIMATED VALUE OF PRODUCTION

	1939	1940	1941	1942	1943	1944	10-Year Av.
Pulp and Paper	$16,191,000	$22,971,000	$27,723,000	$27,457,000	$25,597,000	$30,391,000	$20,476,800
All Forest Products	88,221,000	102,804,000	119,920,000	124,720,000	124,720,000	146,611,000	96,900,800

WOOD PULP: Exports by Principal European Countries, 1935 and 1937

(Tons of 2,000 pounds)

Country	1935 Total Exports	1935 Exports to non-European Countries	1935 Exports to European Countries	1935 Exports to non-specified Countries	1937 Total Exports	1937 Exports to non-European Countries	1937 Exports to European Countries	1937 Exports to non-specified Countries
Exports from:								
Sweden	2,318,048	1,089,385	1,228,640	23	2,813,616	1,402,771	1,410,845	---
Finland	1,337,881	338,688	999,193	---	1,620,296	401,864	1,218,432	---
Norway	567,764	160,812	406,952	---	723,516	178,894	544,622	---
Austria	170,674	1,583	164,076	5,015	205,296	16,004	189,292	---
Germany	326,570	114,974	205,048	6,548	183,256	85,756	95,424	2,076
Czechoslovakia	100,839	37,320	61,720	1,799	149,767	54,181	95,586	---
Estonia	87,689	14,676	69,302	3,711	75,724	19,642	55,265	817
Lithuania	57,528	13,280	44,113	135	75,641	20,235	54,520	886
Belgium	19,607	---	19,489	118	26,300	---	25,739	561
Yugoslavia	11	---	11	---	9,000	---	9,000	---
Latvia	2,935	1,171	1,764	---	8,551	3,931	4,620	---
Rumania	9,340	---	---	9,340	8,000	---	---	8,000
Great Britain	4,032	---	---	4,032	8,000	---	---	8,000
Switzerland	2,917	---	---	2,917	7,881	---	---	7,881
France	2,725	---	---	2,725	4,381	---	---	4,381
Poland	4,363	---	---	4,363	2,735	2,735	---	---
Netherlands	2,489	---	2,489	---	2,125	---	2,125	---
TOTAL	5,015,412	1,771,889	3,202,797	40,726	5,924,085	2,186,013	3,705,470	32,602

Source: World Wood Pulp Statistics, United States Pulp Producer's Association, 1937 and 1938.

U. S. EXPORTS OF PULPWOOD, PULP, PAPER AND PAPER PRODUCTS

(In short tons except pulpwood)

Item	1937	1939	1941	1943	1944
Pulpwood (in cords)	23,798	50,165	72,733	36,412	20,355
Wood pulp, total	322,544	139,504	328,608	300,700	218,412
Bleached sulfite: rayon and special	(1)	48,232	34,038	22,884	10,729
Bleached sulfite: other	(2) 207,589	23,243	78,504	44,991	38,462
Unbleached sulfite	105,016	40,915	77,987	89,691	46,240
Bleached sulfate	(3)	(3)	10,474	16,344	6,697
Unbleached sulfate	(3)	14,816	118,588	120,552	105,673
Soda pulp	7,967	4,013	2,174	5,341	10,581
Screenings and other	(4) 1,972	(5) 8,285	6,843	897	30
Paper, paperboard, and paper products	221,419	248,569	464,389	319,922	313,911
Paper and paperboard	176,783	197,903	399,245	254,709	253,603
Paper, total	94,211	96,628	264,164	181,657	180,307
Newsprint	17,045	13,495	70,265	35,256	31,162
Book paper, uncoated	14,961	15,387	41,406	22,415	22,022
Fine paper	20,466	21,115	46,430	57,907	67,741
Wrapping, bag and converting paper, total	27,706	31,842	79,727	45,232	41,001
Greaseproof, glassine, cellophane and parchment	4,521	4,620	9,746	17,374	17,886
Wrapping and sack	18,587	17,608	44,137	12,628	12,280
Kraft wrapping and sack	4,598	9,614	25,844	15,230	10,835
Tissue and cigaret	5,251	6,447	14,210	11,776	11,170
Paperboard and wallboard	82,572	101,275	135,081	73,052	73,296
Paper products, total	44,636	50,666	65,144	65,213	60,308
Surface-coated paper	5,294	7,076	10,346	9,151	16,445
Toilet paper	5,760	5,268	8,699	9,594	6,103
Paper towels and napkins	2,025	2,980	3,026	1,840	1,650
Shipping sacks	(1)	2,609	4,371	5,324	5,604
Paper bags	10,160	6,563	6,259	4,443	2,955
Shipping containers	(1)	5,404	9,323	9,236	4,966
Boxes and cartons	6,928	4,283	3,235	7,417	3,756

(1) Not shown separately.
(2) Includes rayon and special chemical grades.
(3) Included under "other wood pulp."
(4) Includes bleached and unbleached sulphate pulps.
(5) Includes bleached sulphate pulp.

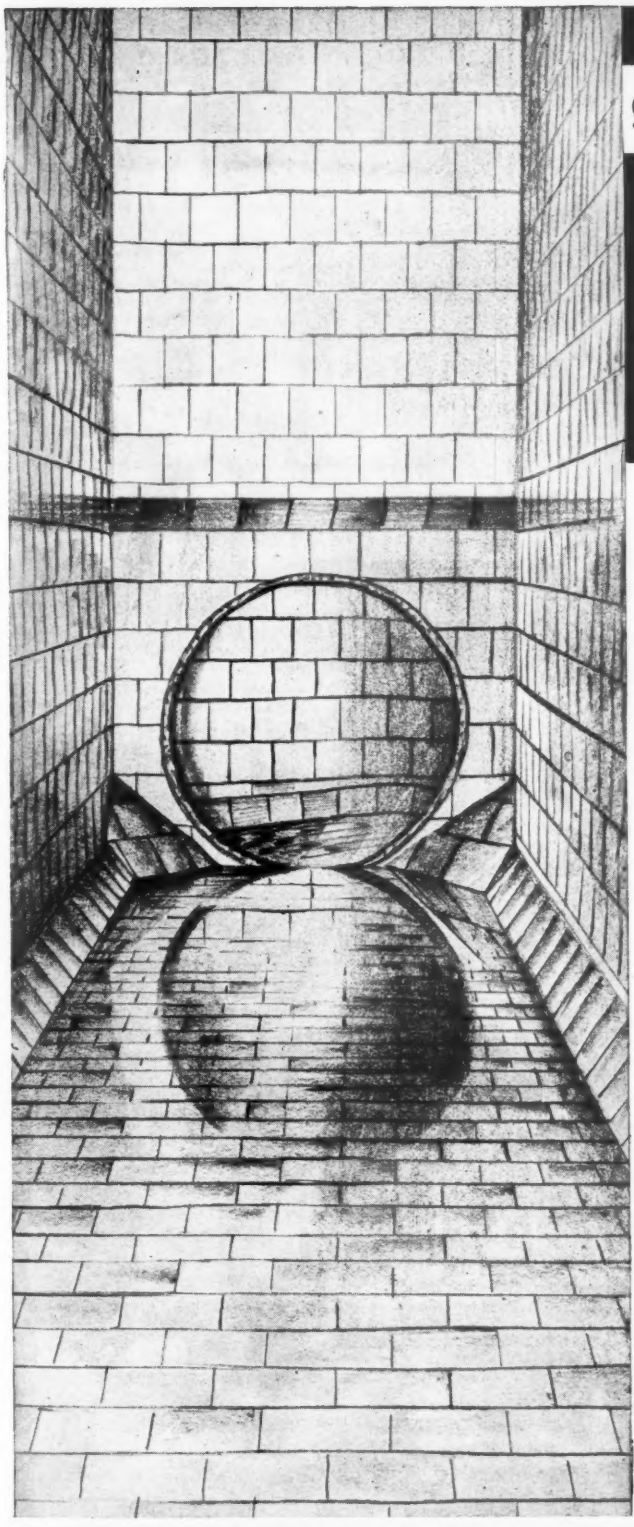
Source: Bureau of the Census.

U. S. IMPORTS OF PULPWOOD, PULP, PAPER AND PAPER PRODUCTS

(In short tons, except wood)

Item	1937	1939	1941	1943	1944
Pulpwood, total (in cords)	1,522,868	1,130,874	1,632,605	1,391,392	1,368,109
Wood pulp, total	2,394,605	2,026,441	1,157,886	1,305,549	1,071,623
Bleached sulfite: rayon and special	91,805	88,052	121,130	129,379	131,407
Bleached sulfite: other	420,156	386,057	270,394	231,291	189,273
Unbleached sulfite	919,680	661,193	361,397	519,190	399,418
Bleached sulfate	111,825	108,252	59,394	47,664	47,458
Unbleached sulfate	622,390	546,167	116,224	104,678	98,557
Soda pulp	10,327	8,952	15,864	20,181	16,404
Groundwood	218,422	227,768	197,991	236,484	176,887
Paper, paperboard, and paper products	3,412,409	2,687,484	3,123,490	2,720,906	2,576,277
Paper and paperboard	3,401,154	2,682,856	3,056,066	2,717,614	2,573,957
Paper, total	3,362,785	2,654,440	3,019,279	2,663,559	2,522,071
Newsprint	3,317,024	2,615,128	2,982,375	2,637,429	2,491,452
Book paper, uncoated	15,407	13,408	28,474	23,329	27,246
Fine paper	10,399	9,808	2,741	637	389
Wrapping, bag, and converting paper, total	18,033	14,955	4,490	951	2,100
Greaseproof, glassine and cellophane	504	223	4	3	6
Parchment	226	117	5	2	.....
Kraft wrapping and bag	16,611	12,735	2,269	734	689
Wrapping and bag, except kraft	692	1,880	2,212	212	1,405
Paperboard and wallboard	38,369	28,416	36,787	54,055	51,886
Wallboard	19,199	12,204	20,669	28,349	28,388
Paper products	11,255	4,628	67,424	3,292	2,320

Source: Bureau of the Census.



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Complete Lining Service

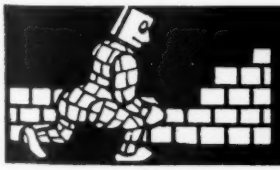
MEETS TODAY'S NEEDS

for Better Performance — Longer Life

Stebbins service is based on research and experience covering 62 years devoted exclusively to developing materials, designs, and installation techniques. This research and experience covers practically every known type chest, reaction vessel, and treating or storage tank used in the pulp and paper industry. Stebbins linings and tanks are installed not only throughout North America, but also in Central and South America, and in the Orient.

Wherever it may be, one contract, one responsibility covers the complete installation. This involves; a study of your problems, a design based on the chemical and mechanical requirements involved, and a construction that will assure long life.

Consult Stebbins regarding your next lining installation.



SEMCO

Stebbins Engineering Corporation

TEXTILE TOWER SEATTLE 1, WASHINGTON

Box and building boards set new alltime high production record in U. S. Containers in slight decline. Swedes set hardboard pace.

Production of boxboard and building board in the United States during 1945 reached new all-time high records.

In these two categories, even the unusually high levels of production reached in 1944 were surpassed, albeit not by much, but there was a slight drop-off from the over-all total of paperboard and also for the important category of containerboard.

There will be noted that in tables published on these pages there is some disparity between figures issued by the U. S. Department of Commerce and the National Paperboard Association.

The latter, of course, strictly adheres to production of the strictly paperboard mills, which make up its membership, whereas the government lumps into its figures the building, insulating and miscellaneous boards of pulp base which swelled its total paperboard figure for 1945.

Here are the government's figures:

U. S. Paperboard Production

(*In Tons*)

	1945	*1944*
Container	4,130,424	4,228,304
Folding box	2,266,861	2,116,152
Set-up box	718,972	750,313
Cardboard	69,924	69,709
Building	1,121,824	1,087,467
Miscellaneous	597,623	710,623
Tube stock	361,034	458,107
Total	8,905,628	8,962,568

In a more accurate appraisal, perhaps, of its own class of mills, besides being a later one, the National Paperboard Association reports total paperboard production of 7,873,400 tons in 1945, which is slightly under 1944's mark of 7,922,900 tons and also 1941's output of 7,891,000. But for five years running the association's figures have surpassed the 7-million mark and this about 50% above pre-war levels, as, for example, 4,938,000 tons in 1938.

In containerboard, the association's 1945 total was 4,075,400 tons, slightly under the 1944 mark of 4,126,700 tons. In boxboard, it confirmed a new high all-time record, showing production in 1945 of 3,798,000 tons, or just 2,000 tons over 1944.

The sharp reduction in the military demand for container materials is reflected in the slight recession in certain categories, but, despite this, the paperboard industry as a whole is expected to continue to grow, as it has not yet felt the full weight of the postwar civilian need for containers.

The outlook is for continued high demand for all grades of paperboard which is fulfilling a more and more essential demand and whose merits were vastly improved and made visible during the war years. A number of new sizeable units are scheduled to add to production in the East and the South and in the West some expansion is planned.

The tremendous expansion underway in the building boards is also noteworthy. It opens up a great field of utilization for former wood waste and companies which are entering this field will be distinguished additions to the pulp and paper industry of the North American continent. The expiration of the Masonite patents in 1944 has been a stimulant to active interest in the production of hardboards and, meanwhile, much greater use of softboard for building and insulation has been encouraged. The fuel oil rationing of war years made the general public acutely aware of the value of these products.

Paperboard mills were keeping up a high pressure pace of production in the early part of 1946, with their mills operating at 97%, 98%, 99% and then 100% capacity in successive weeks in late February and through most of March. This was a few percentage points above 1945's pace.

Increases ranging from $2 to $4 a ton have been granted in manufacturers' ceiling prices for 30 grades of paperboard sold east of the Rocky Mountains. Most of the grades affected are boxboard grades. The U. S. Department of Commerce says prices on products of these grades were not increased.

Packaging Expansion

Revolutionary changes in the packaging field are in the making as a result of wartime development of new materials and methods. These developments necessitated by the war, have had a greater effect on the industry than the introduction of entirely new container types, according to the Department of Commerce.

Improvements have been made in

STATES LEADERS IN FIBER BOARD

It is difficult to ascertain what states actually led in production of some types of fiber boards, because the U. S. Department of Commerce lumped some states together in their 1945 statistics.

For example, Louisiana, second in this list, is obviously the real leader in container board production.

Michigan led in folding boxboard and New Jersey in set-up boxes. The others are pretty hard to disentangle.

Container Board

1st—N. Carolina—S.Carolina—Ga.—595,275.
2nd—Louisiana—587,321.
3rd—Florida—453,143.
4th—Del.—Maryland—Virginia—357,337.
5th—Michigan—351,819.
6th—Washington—Oregon—Calif.—321,854.

Folding Boxboard

1st—Michigan—301,290.
2nd—New York—300,693.
3rd—Ohio—287,329.
4th—Illinois—172,262.
5th—Washington—California—160,922.
6th—Connecticut—147,945.

Set-up Boxboard

1st—New Jersey—189,574.
2nd—Pennsylvania—79,099.
3rd—New York—72,380.
4th—Maine.—N. H.—Vt.—Mass.—59,535.
5th—Minn.—Iowa—Kansas—Colo.—58,917.
6th—Illinois—55,293.

Cardboard

1st—Ohio—Indiana—24,291.
2nd—N. Y.—New Jersey—Penn.—8,889.
3rd—Michigan—5,325.

Building Boards

1st—Va. — Fla.—Ala.—Miss.—La.—Texas — 661,662.
2nd—Minn.—Ia.—Mo.—Kan.—Col.—200,771.
3rd—Me.—N. H.—Mass.—R.I.—Conn.—N.Y. —N.J.—Penn.—154,469.
4th—Wash.—Oregon.—California—50,607.

Miscellaneous Boards

1st—Michigan—81,297.
2nd—Pennsylvania—60,659.
3rd—Illinois—58,632.

PAPERBOARD MILL CENSUS

In Tons

CONTAINER BOARDS

GRADES	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Liners - Jute	1,029,300	1,047,600	674,900	794,300	796,400	1,073,900	819,700	1,088,900	1,168,200	1,180,100
Liners - Kraft Cyl.	285,900	290,800	238,900	279,800	246,200	285,600	276,700	152,300	93,200	97,100
Kraft Four	389,600	461,600	638,200	803,800	923,300	1,201,400	1,174,600	1,252,900	1,340,400	1,308,000
Total Kraft	675,500	752,400	877,100	1,083,600	1,169,500	1,487,000	1,451,300	1,405,200	1,433,600	1,405,100
Total Liners	1,704,800	1,800,000	1,552,000	1,877,900	1,965,900	2,560,900	2,271,000	2,494,100	2,601,800	2,585,200
Chip-Corrugating	97,700	96,200	76,500	75,900	75,500	77,800	72,200	83,800	97,400	87,700
Solid Fibre	237,000	246,800	177,800	208,600	202,800	273,100	338,300	333,500	338,100	312,300
Total Chip	334,700	343,000	254,300	284,500	278,300	350,900	410,500	417,300	435,500	400,000
.009 Straw, Etc.	556,800	589,100	461,400	574,900	611,400	803,200	662,800	870,800	969,000	919,300
.009 Kraft	141,900	148,400	212,100	263,000	292,000	329,400	269,300	157,600	120,400	170,900
Total .009	698,700	737,500	673,500	837,900	903,400	1,132,600	932,100	1,028,400	1,089,400	1,090,200
T O T A L	2,738,200	2,880,500	2,479,800	3,000,300	3,147,600	4,044,400	3,613,600	3,939,800	4,126,700	4,075,400
BOXBOARDS										
Folding Box	1,212,200	1,237,800	1,162,400	1,385,100	1,413,100	1,749,300	1,552,100	1,737,900	1,782,500	1,868,400
Set-Up Box	587,700	570,000	518,800	585,700	613,200	731,500	612,900	599,800	543,200	510,800
Total	1,799,900	1,807,800	1,681,200	1,970,800	2,026,300	2,480,800	2,165,000	2,337,700	2,325,700	2,379,200
Other	798,600	867,200	777,500	976,400	1,144,200	1,365,800	1,364,400	1,349,200	1,470,500	1,418,800
T O T A L	2,598,500	2,675,000	2,458,700	2,947,200	3,170,500	3,846,600	3,529,400	3,686,900	3,796,200	3,798,000
SUMMARY										
JUTE,Chip,Boxboard Straw, Etc.	4,458,300	4,576,700	3,776,800	4,474,000	4,632,900	5,899,900	5,216,900	5,847,300	6,106,700	6,061,600
KRAFT,Liner,.009Etc	878,400	978,800	1,161,700	1,473,500	1,585,200	1,991,100	1,926,100	1,779,400	1,816,200	1,811,800
TOTAL ALL GRADES	5,336,700	5,555,500	4,938,500	5,947,500	6,318,100	7,891,000	7,143,000	7,626,700	7,922,900	7,873,400

Issued: March 14, 1946

NATIONAL PAPERBOARD ASSOCIATION

PAPERBOARD PRODUCTION BY ZONES

Figures not available for 1945 as compilation of tonnage by zones discontinued by National Paperboard Association.

1944

Short Tons

Zone.	Liners	Corr. Material	Chip	Folding Boxboard	Set-up Boxboard	Other	Total
New England	62,500	14,600	31,600	190,300	57,100	110,000	466,100
Middle Atlantic	454,500	295,100	78,800	529,100	334,900	449,500	2,141,900
Lake States	539,600	404,400	177,500	792,300	98,200	599,100	2,611,100
South	1,292,900	254,600	40,500	80,800	21,600	175,900	1,866,300
Western	253,200	120,800	107,300	193,400	32,500	130,300	837,500
Total	2,602,700	1,089,500	435,700	1,785,900	544,300	1,464,800	*7,922,900

*In addition, Canadian Imports were 9,200 tons.
Western Group includes all states west of the Mississippi River with the exception of Texas, which is included in the Southern Group.

PAPERBOARD PRODUCTION BY ZONES

1943

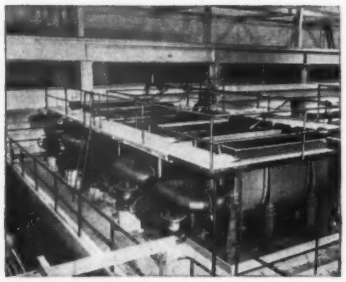
Short Tons

Zone.	Liners	Corr. Material	Chip	Folding Boxboard	Set-Up Boxboard	Other	Total
New England	74,800	29,900	17,300	190,400	61,400	87,700	461,500
Middle Atlantic	456,200	224,500	85,700	493,600	370,700	406,600	2,069,300
Lake States	538,100	386,800	193,900	811,200	114,500	543,700	2,588,200
South	1,192,700	277,200	25,900	72,500	24,500	160,200	1,753,000
Western	232,300	110,000	94,500	170,200	28,700	119,000	744,700
Total	2,494,100	1,028,400	417,300	1,737,900	599,800	1,349,200	*7,626,700

*In addition Canadian imports were 16,800 tons.
Western Group includes all states west of the Mississippi River with the exception of Texas, which is included in the Southern Group.

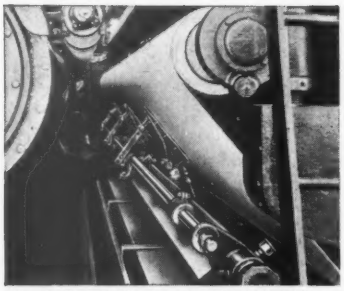
REVIEW OF BIRD MACHINERY

For Better Pulp and Paper and More Of It per Day at Lower Cost per Ton

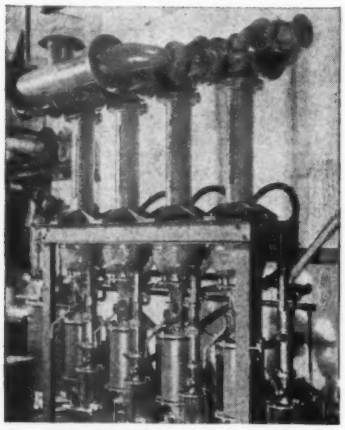


The BIRD SCREEN handles better than eighty per cent of all the paper made in North America. It is essential for continuous, high speed production of uniformly good paper.

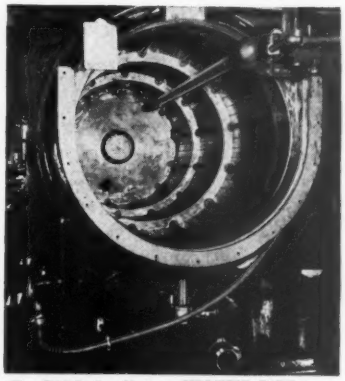
The JONSSON SCREEN for knotting and as a coarse, fine or tailings screen, turns out a big volume of clean pulp, with minimum loss of good stock in the tailings, uses very little power, is easy and inexpensive to install, operate and maintain.



The VICKERY FELT CONDITIONER keeps press felts continuously clean and open without mid-week shutdowns, improves paper finish and assures maximum water removal at the presses.

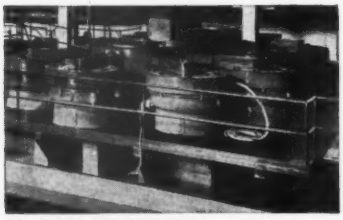


The BIRD DIRTEC provides the most effective means of removing dirt from paper stock by employing the pressure drop principle. Continuous in operation, easy to install, no moving parts.

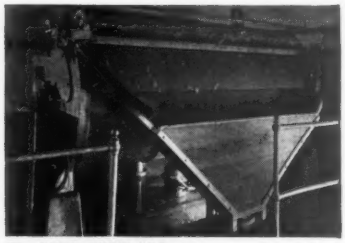


The BIRD Oscillating SHOWER PIPE keeps screen plates continuously clean and open, employs a minimum amount of shower water. Maximum screening efficiency and improved control of papermaking water result.

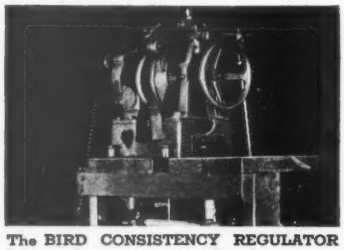
VICKERY DOCTORS keep papermaking roll surfaces always in shape to do their best work. Engineered for press rolls, wire rolls, breast rolls, dryers, calenders and super-calenders.



The BIRD CENTRIFINER produces cleanest paper of fine and special grades by triple centrifugal treatment; assures thorough separation of specks of heavy dirt, light dirt, rubber particles, etc.



The BIRD SAVE-ALL recovers good stock from waste water at lowest net cost. It puts stock and water in shape for immediate re-use. Simple and practical to install, operate and maintain.



The BIRD CONSISTENCY REGULATOR holds stock consistency to within plus or minus 0.1%, operating on stock from less than 1% to 12% consistency. Instantaneous in action. Provides dependable, automatic control at every desired point in the pulp and paper mill.

For complete information on any or all items of Bird Machinery, get in touch with

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

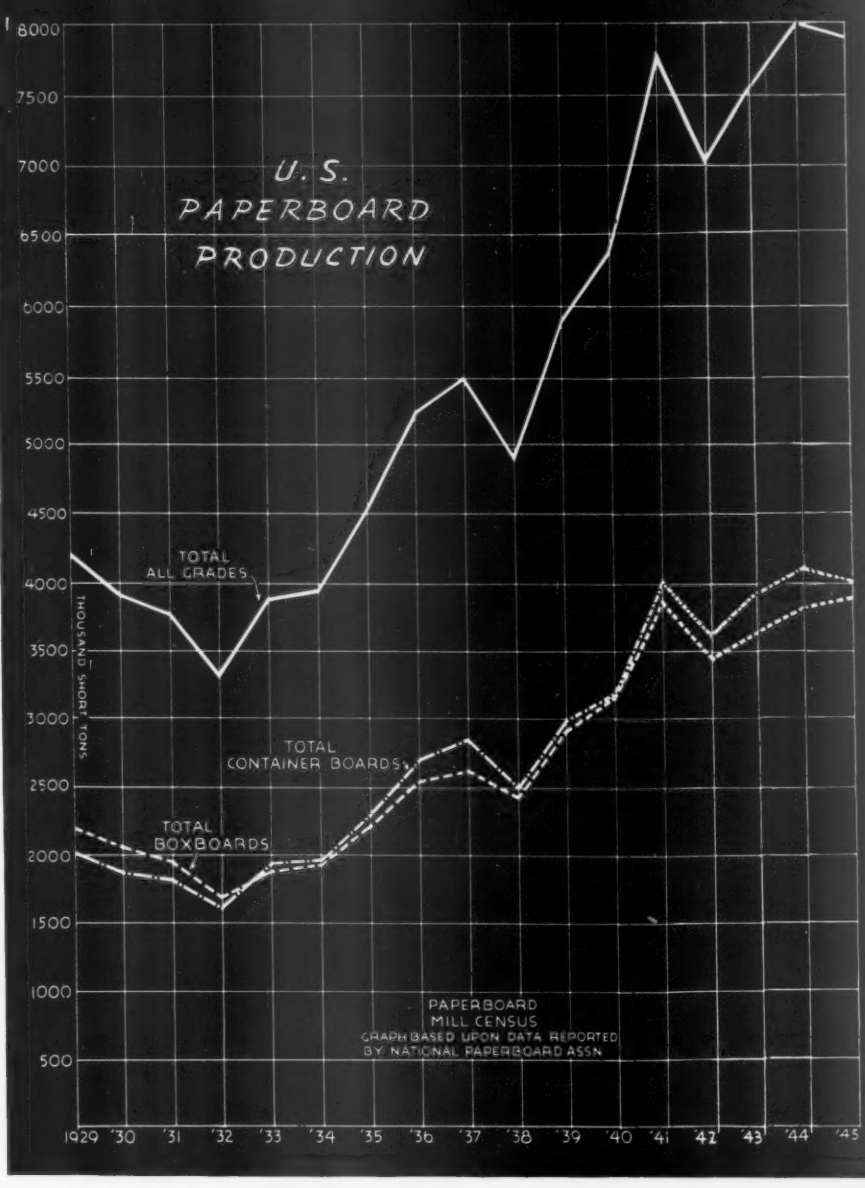
metal, glass and wooden containers as well as in flexible packaging. Paper, transparent films, metal foils, and combinations of the three are among the materials now used to give a package special desired qualities. These include resistance to moisture, grease, heat, cold, and insects.

"In some cases the war accelerated enormously a trend already begun: in others military necessity demanded performances undreamed of in ordinary commerce," the Department's publication, Domestic Commerce states.

"It is doubtful whether anything short of a national emergency could have inspired the elaborate pooling of effort and information which made some of these developments possible. Shortages of material taxed but never exhausted the ingenuity of American industry. The know-how acquired during the war in shipping tremendous volumes of goods all over the world will have a definite carryover in the field of export."

Although not strictly a part of this article on paperboard, mention should be made of the fact that packaging of frozen fruits and vegetables has increased about 75% from 1941 to 1945. Many new types of containers, both rigid and flexible, have been developed for commercial and home locker use. The Flexible Packing Institute, incidentally, predicts the value of its sales will increase from $100,000,000 to $250,000,000 within the next ten years.

Perhaps the most significant change in packaging has taken place in the attitude of some large users of containers. In many instances it was found that a simple change in design of the product packed permitted safe, efficient and economical packaging. Large machines and parts which can be "knocked down" present simpler problems than the complete assembly; relatively small changes in design permit "floating" the load in a package. Realization that a product must be shipped is making packaging an integral part of production planning and design.



In addition to developing new packages, much progress has been made in improving and extending the uses of the more familiar containers. A new asphalt base weatherproof coating for tight barrels protects them against moisture or temperature influences, adding to their life and usefulness. Through the use of various coverings, linings, and laminants, fiber drums are made moisture and grease-proof. Folding and set-up boxes, fiber cans, paper shipping sacks, etc., have found many new applications which will persist even when previously scarce containers become available again.

OREGON-WASHINGTON FROZEN FOOD PACKS

(About 50% of U. S. total)

Year—	Wooden barrel pack lbs.	Tin can pack lbs.	Paper box and carton pack lbs.	Total pack lbs.
1926-30 average	33,400,000	11,510,000	25,000	44,935,000
1931-35	36,365,000	7,047,000	692,000	44,104,000
1936-40	39,900,000	10,910,000	8,165,000	58,975,000
1943	59,146,000	3,332,000	39,062,000	101,540,000

Building Boards—Hard and Soft

The building board industry in the United States—that portion of its using pulp or fiberboards of various kinds—has grown amazingly.

Before the war its output was negligible. In 1939 it was only 114,000 tons and in 1940 it was still only 179,000, according to Department of Commerce figures. By 1942 it jumped to the million-ton mark and has remained there, even adding about 35,000 more tons in 1945

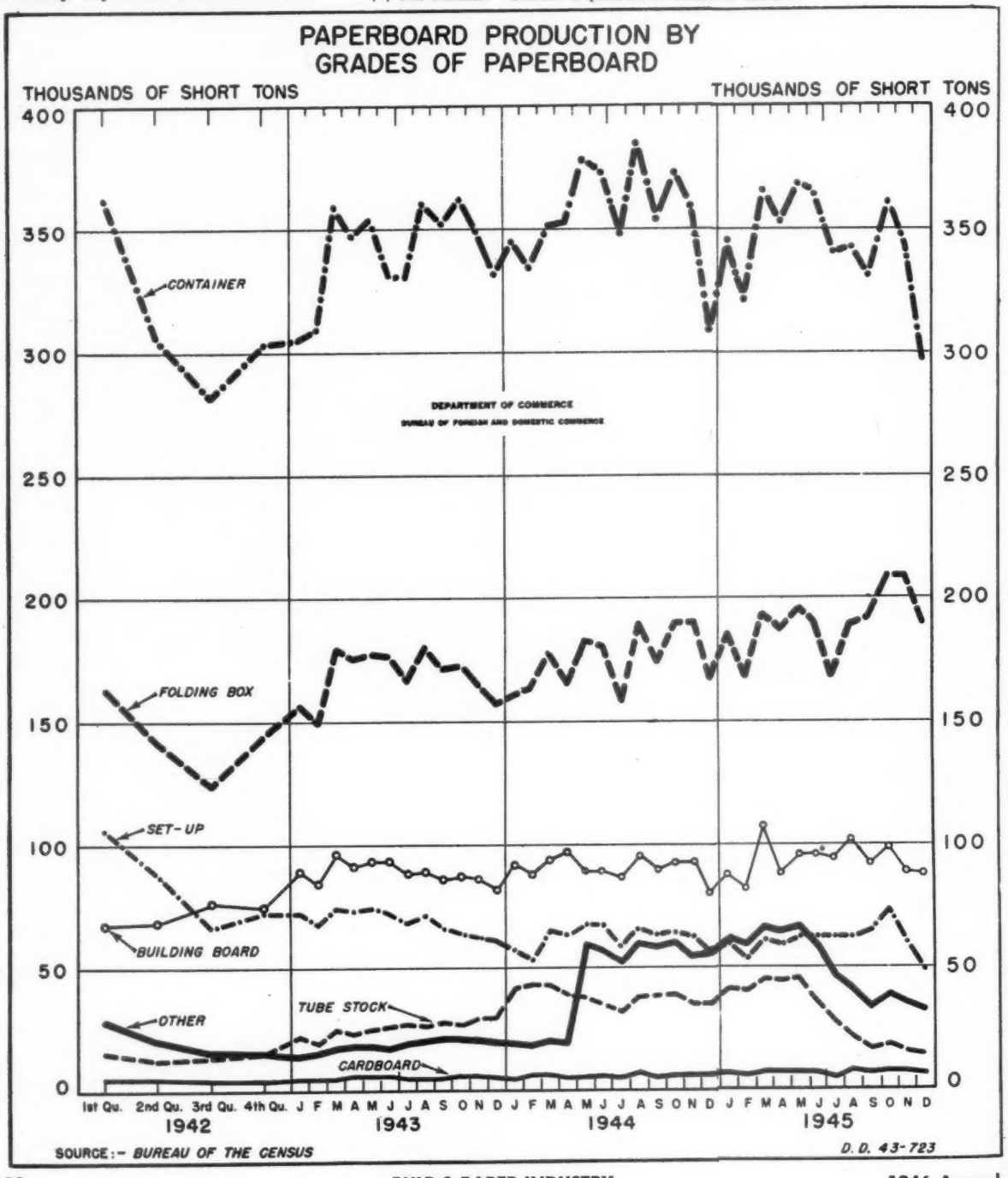
for record high of 1,087,467 tons. The Department of Commerce figures in each of these years has had another category, described as "other boards" or "miscellaneous boards," and this increases the above totals by from 300 to 500,000 tons.

Even these figures do not cover all the branches of building or pulp board that are developing. The trend in the plywood industry is toward greater use of pulp or paper "overlays" which improve the product in many ways and will extend at the

ESTIMATED PRODUCTION OF CONTAINERS

Type of Container	*1940*	*1943*	*1944*	*1945*
Consumer-type containers:				
Metal crowns, thousand gross	143,929	217,032	242,168	253,500
Glass containers, thousand gross	52,116	92,707	99,727	105,300
Bulk ice cream, frozen food, butter cartons, tons	(*)	(*)	124,677	125,000
Folding boxes, thousand tons	1,398	1,662	1,730	1,850
Set-up boxes, thousand tons	613	829	750	740
Fiber cans and tubes, thousand tons	(*)	307	360	360
Grocery and variety bags, thousand tons	606	518	375	360
Shipping containers:				
Corrugated and solid fiber containers, thousand tons	3,114	4,100	4,173	4,160
Fiber drums, tons	10,000	56,600	63,600	60,000

(*) Not available. Sources: Department of Commerce estimates.



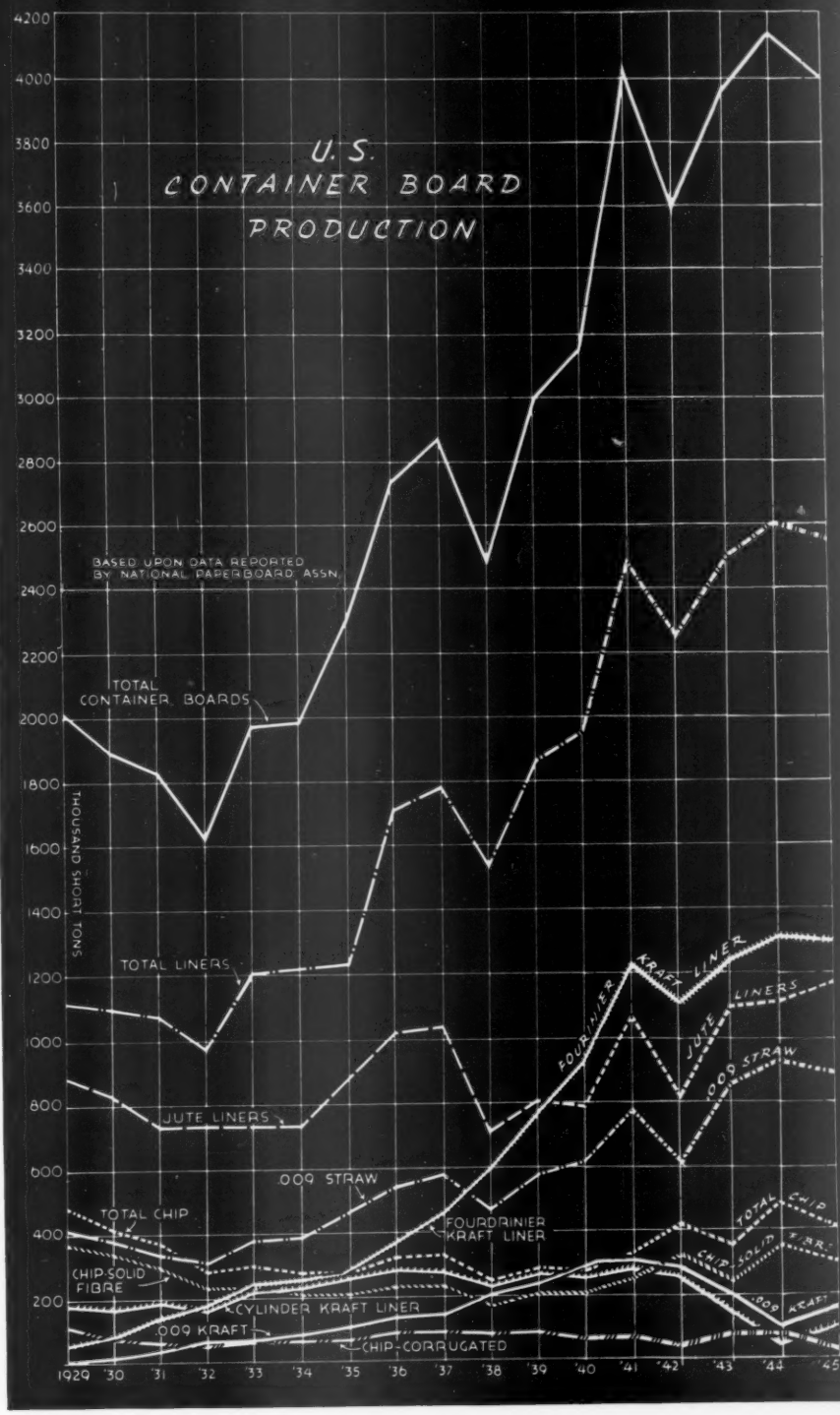
same time the availability of the big peeler logs, which are harder to get every year. Paper and pulp companies have interested themselves actively in this field. Also several paper companies are manufacturing large plastic forms for conversion into building uses or big equipment.

In the Far West, where much wood has been burned or left in logging stands, because until now it was uneconomical to use, waste is to be used for building boards. The expiration of Masonite patents, last year, has interested many in the hardboard field. The softboard field also is expanding. In both processes, defibrating machines and Fourdrinier machines may be used but, of course, the hardboard is compressed, also, to about one-quarter the thickness of softboard.

In the building board field, Celotex has a $7,000,000 expansion program; Flintkote has a $3,000,000 project; Masonite and U. S. Gypsum have similar intentions; Minnesota & Ontario Paper Co. has installed another big Insulite machine; Simpson Logging Co., one of the biggest timber operators of the west, is entering the field; Fir-Tex is making improvements; Weyerhaeuser Timber Co.'s wood utilization objectives may logicaly involve this field, in which its affiliated firm, Wood Conversion Co. of Cloquet, is a leader.

In Sweden, the hardboard industry has expanded to about equal the U. S. capacity of 250,000 tons. In that country, Masonite held the patent only on its gunshot process of treating chips, and not specifically on the product, as in the U. S., which permitted other similar products. As a result there are about 15 hardboard plants in Sweden, besides about a dozen softboard plants. The first hardboard plant was built in 1928 and the nation's capacity was only 120,000 tons before the war.

In 1939 Sweden's domestic consumption of wallboard was 82,000 tons. As a result of a special building program and military demands, domestic consumption rose to about 100,000 tons in 1944. This is a record which probably is not exceeded by any other country, and it is doubtful that it can be maintained in the future. On the other hand, the 1944 exports were only 10% of domestic consumption, compared with 1939 exports amounting to 50% of domestic consumption. As the total domestic consumption and exports in 1944 utilized only 45% of



the productive capacity and since domestic consumption cannot be increased, the industry places its hopes in future exports.

Container research is still in need of further investigation, according to T. A. Carlson, chief of the Madison, Wis., U. S. Forest Products Laboratory's division of material containers. For example, he said knowledge about fiberboard boxes has never been brought to the same level of thoroughness as has that concerning nailed wood boxes. He said other types of containers worth attention are cleated fiberboard boxes, now extensively used, and boxes made of combinations of fiberboard and wood.

Waterproof and vaporproof paper and paperboard and some of the

PAPER · · · America's 6th Industry

PAPER TAPE FOR RECORDING SOUND

(NEWS ITEM: *Coated paper tape to record and play back sound is being used for home recorders.*)

Soon party-goers will have a lasting memory of the evening's fun—recorded on paper tape. A new type of home recorder which uses magnetically coated paper tape as the recording medium has just been announced. The paper tape allows erasing, permitting it to be used over and over again. Unwanted sections can be torn out, and the torn ends connected by any suitable adhesive.

There are thousands of new uses for paper. Filter paper for coffee makers . . . paper plates for frozen foods . . . paper covered steel core for box strapping . . . paper bags for packaged coal . . . each new use calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

In addition to two of the largest and fastest Fourdrinier Paper-Making Machines—one for book and high-grade printing papers and one for white paper for bags—Puseyjones also have under construction a third machine of record size and speed, of Cylinder type, equipped with the latest Stream Flow Vat System for the manufacture of floor covering felt.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

high strength V-box and other containers developed in the war are expected to have extensive civilian use. Hinde-Dauch Paper Co. has been a leader in developing new techniques for "pre-packaging" of all kinds of goods, thus saving much labor and time in handling from manufacturer to consumer.

What many in the industry feel about paper packaging has been typically expressed by L. W. Sutherland, chairman of the board of the Sutherland Paper Co., Kalamazoo, Mich. He believes that the future of the paper industry in general is bright, but is particularly optimistic for the carton and container branch. He believes that paper will retain a great part of the field in which it has entered as a substitute. He points to one instance of a manufacturer who used nothing but tin cans before the war and offered to sign a contract for several million paper containers. There are, he says, many similar instances.

Some figures on the frozen fruit pack are of significance. About 50% of the frozen fruit pack in the U. S. is produced in Washington and Oregon and a table on page 79 shows how rapidly paper has advanced as a packaging material in comparison with wood and tin.

It is possible that some of the packers who formerly used tin cans, but who have learned to use and like fibre packages, will continue to utilize paper when tin is once more available.

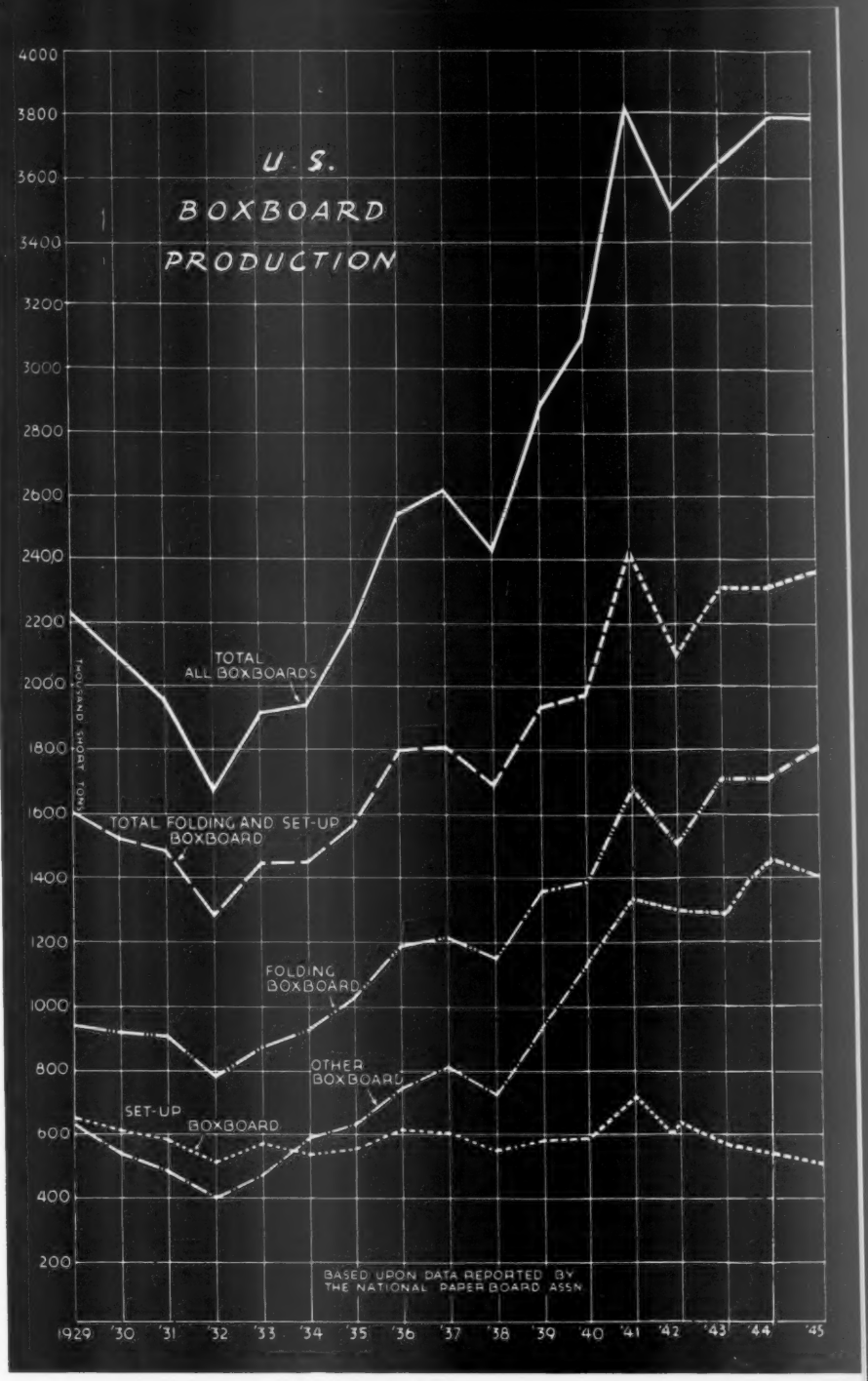
The trend toward self-service in food stores will bring marked changes in the packaging and display of frozen foods.

"Automat" Groceries Offer New Paper Market

New markets for paper packaging is evident in a forecast made at a meeting of the Refrigeration Equipment Manufacturers Association in February in Chicago. The officials of the association confidently predicted coin-operated vending machines designed for the automatic sale of frozen fruits, vegetables and meats. Difficulty in establishing standard quality and price have been the stumbling blocks heretofore in frozen food vending machines, but mechanically it is already possible.

Paper Cups Reduce Epidemics

"To the flimsy paper drinking cup belongs much of the credit for the fact that there has been no major epidemic either on the battle front or on the home front during the war," according to Homer N. Calver, of New York, secretary of the Public Health Committee of the Paper Cup and Container Institute.



Up Goes Steam Cost

HIGHER costs for steam in the pulp and paper industry may be anticipated. There are signs of this prospect on every side.

Uncertain supply and a difficult labor situation is likely to affect the future coal picture adversely from the point of view of many mills in this industry.

In the west, especially, and everywhere for that matter, it is becoming uneconomical to burn so-called waste wood—it has other more profitable uses—and hydraulic log barking is reducing the available amount.

As for oil, the Texas Company's annual report says "unless new important reserves are discovered in the United States, this country must become a substantially larger importer of petroleum in order to provide for its military, industrial and civilian requirements.

Dept. of Commerce and U. S. Pulp Producers agree supply is running behind demand. U. S. consumption of 11,362,633 tons sets record.

WASHINGTON STATE IS FIRST; MAINE SECOND, AND LOUISIANA THIRD, IN PULP PRODUCTION

Where U. S. pulp comes from is shown graphically in the following table prepared by the Department of Commerce.

Washington state again leads the field as the biggest pulp producer in the nation, with an output of 1,265,436 tons in 1945. Maine was second with 1,097,939 tons. Louisiana was third with 949,221 tons. Wisconsin was fourth with 875,408 tons. The next position is confused because the two Carolinas are combined and together they rank next with 880,219 tons.

All these states, except the Carolinas, showed slight increases over 1944, but the latter dropped off rather sharply from its total of that year. The 1944 figures are shown below.

Comparing this year's total with 1943 figures (see 1945 North American Review Number of PULP & PAPER INDUSTRY), Washington's total was more than 112,000 tons above that state's production three years ago. Maine, on the other hand, showed a very slight decline of about 5,000 tons. Louisiana's 1945 total was more than 80,000 tons over that of 1943. The Carolinas were almost back to their 1943 level.

PRODUCTION OF WOOD PULP BY TYPE, BY REGION AND BY STATE, 1945 AND 1944
(Tons of 2,000 pounds)

Type of wood pulp, region and state	1945	1944
All types of wood pulp, United States total....	10,167,200	10,108,443
New England States, total.....	1,333,581	1,277,826
Maine.....	1,097,939	1,043,209
New Hampshire.....	182,964	179,129
Vermont.....	17,653	20,508
Massachusetts and Rhode Island.....	35,025	34,980
Middle Atlantic States, total.....	812,116	811,379
New York.....	497,314	497,252
New Jersey.....	52,304	46,158
Pennsylvania.....	262,498	267,969
East and West North Central States, total....	1,494,056	1,475,637
Ohio and Illinois.....	79,505	72,396
Michigan.....	201,811	206,754
Wisconsin.....	875,408	857,986
Minnesota.....	337,332	338,501
South Atlantic States, total.....	2,597,873	2,644,854
Maryland and Virginia.....	612,085	657,312
North Carolina and South Carolina.....	880,219	917,112
Georgia.....	416,205	415,282
Florida.....	689,364	655,148
East South Central States, total.....	934,076	883,777
Tennessee and Alabama.....	456,877	430,663
Mississippi.....	477,199	453,114
West South Central States, total.....	1,357,123	1,346,254
Louisiana.....	949,221	929,313
Arkansas and Texas.....	407,902	416,941
Pacific States, total.....	1,638,375	1,668,716
Washington.....	1,265,436	1,256,374
Oregon and California.....	372,939	412,342

Wood pulp supply for the United States is running short of the apparent demand or "consumption needs" for 1946.

Both the U. S. Department of Commerce and the U. S. Pulp Producers Association are in agreement on that point. A government analysis of the market wood pulp outlook shows a slight shortage in prospect for paper mills, although non-paper manufacturers are expected to get an adequate supply. Meanwhile, the association has estimated a shortage for the first six months of 1946, although it concedes that conditions might improve in the last six months.

The Department of Commerce figures, published on this page, show a prospective deficit of 150,000 tons in market pulp for paper and paperboard manufacturers. This is not much in the light of total consumption, but it would keep mills which do not make their own pulp, from operating at full capacity and it would possibly hurt some small mills, in view of the usually unequal distribution of imported pulp.

What may change the picture appreciably in the last half of 1946 were the pulp price increases of approximately 10% granted by OPA in April. However, the Department of Commerce made its predictions on the basis of imports of 1,200,000 tons of pulp from Scandinavian countries in 1946. This is about the best that could be hoped for; even under the new price set-up. As a matter of fact, the Department of Commerce indicated it made its calculations with expectation that the long-fought-for price increases would be accepted by OPA.

No one really expected price increases—the first since early 1944 and only the second since 1940—to "flood" the market with pulp. But domestic producers are now encouraged to go after more marginal high cost wood and the Swedes were pleased with the increases except they thought they should have gotten more for bleached pulps. Tables and charts with this article show the price trends.

The U. S. Pulp Producers Association had, early this year, estimated a 500,000 tons total deficit on wood pulp supply in relation to demand for just the first six months of 1946. This was based on expectation of 360,000 tons from Europe, 440,000 tons from Canada and U. S. production of 4,800,000 tons for that period. Estimated U. S. demand for consumption and exports was calculated at 6,100,000 tons.

According to the Association,

(Continued on Page 98)

These tables were issued by U. S. Pulp Producers Association. All figures are in short tons. U. S. government figures are used for production and consumption of major grades and for imports, exports (except two months), and 1944 and 1/1/45 inventories. The association estimated exports for last two months of 1945 and inventories for 12/31/45 and compiled capacity data and domestic shipments from its own reports. It also incorporated its own production and consumption figures for dissolving and semi-chemical (non-paper) grades.

TOTAL WOOD PULP

	1944	1945	% Change
Capacity	11,800,000	12,005,413	+ 2
Consumption	11,066,204	11,362,633	+ 3
New Supply	10,961,654	11,778,933	+ 7
Production	10,108,443	10,164,868	+ 1
Imports	1,071,623	1,754,065	+ 64
Shipments	1,713,427	1,592,542	— 7
Export	218,412	140,000	— 36
Domestic	1,495,015	1,452,542	— 3
Inventory 1/1	427,000	333,000	— 22
Inventory 12/31	333,000	750,000	+125
Inventory Change	—94,000	+417,000	

TOTAL CHEMICAL PULP

	1944	1945	% Change
Capacity	8,907,512	9,049,646	+ 2
Consumption	8,558,096	8,754,688	+ 2
New Supply	8,466,312	9,149,347	+ 8
Production	7,795,014	7,762,700	0
Imports	889,710	1,526,647	+ 72
Shipments	1,662,554	1,539,540	— 7
Export	218,412	140,000	— 36
Domestic	1,444,142	1,399,540	— 3
Inventory 1/1	365,000	290,000	— 21
Inventory 12/31	290,000	686,000	+137
Inventory Change	—75,000	+396,000	

TOTAL MECHANICAL PULP*

	1944	1945	% Change
Capacity	2,892,488	2,955,767	+ 2
Consumption	2,508,108	2,607,945	+ 4
New Supply	2,495,342	2,629,586	+ 5
Production	2,313,429	2,402,168	+ 4
Imports	181,913	227,418	+ 25
Shipments	50,873	53,002	+ 4
Export	0	0	0
Domestic	50,873	53,002	+ 4
Inventory 1/1	62,000	43,000	— 31
Inventory 12/31	43,000	64,000	+ 49
Inventory Change	—19,000	+21,000	

*Includes Groundwood, Defibrated, Exploded and Asplund pulp, and mechanical screenings.

TOTAL SULFITE PULP

	1944	1945	% Change
Capacity	2,906,740	2,880,195	— 1
Consumption	3,082,590	3,123,934	+ 1
New Supply	3,010,768	3,344,310	+ 11
Production	2,386,149	2,358,557	— 1
Imports	720,050	1,045,753	+ 45
Shipments	1,038,471	1,001,511	— 4
Export	95,431	60,000	— 37
Domestic	943,040	941,511	0
Inventory 1/1	256,000	196,000	— 23
Inventory 12/31	196,000	416,000	+112
Inventory Change	—60,000	+220,000	

TOTAL BLEACHED SULFITE PULP

	1944	1945	% Change
Capacity	1,811,368	1,817,850	0
Consumption	1,840,624	1,886,027	+ 2
New Supply	1,794,662	1,897,570	+ 6
Production	1,523,221	1,542,114	+ 1
Imports	320,632	388,456	+ 21
Shipments	798,507	767,100	— 4
Export	49,191	33,000	— 33
Domestic	749,316	734,100	— 2
Inventory 1/1	184,000	152,000	— 17
Inventory 12/31	152,000	163,000	+ 7
Inventory Change	—32,000	+11,000	

PAPER GRADES OF BLEACHED SULFITE PULP

	1944	1945	% Change
Consumption	1,276,624	1,346,027	+ 5
New Supply	1,243,345	1,408,721	+ 13
Production	1,093,676	1,186,297	+ 8
Imports	188,131	242,424	+ 29
Shipments	370,178	404,081	+ 9
Export	38,462	20,000	— 48
Domestic	331,716	384,081	+ 16
Inventory 1/1	46,000	28,000	— 39
Inventory 12/31	28,000	90,000	+221
Inventory Change	—18,000	+62,000	

DISSOLVING and SPECIAL CHEMICAL GRADES of BLEACHED SULFITE PULP

	1944	1945	% Change
Consumption	564,000	540,000	— 4
New Supply	551,317	488,849	— 11
Production	429,545	355,817	— 17
Imports	132,501	146,032	+ 10
Shipments	428,329	363,019	— 15
Export	10,729	13,000	+ 21
Domestic	417,600	350,019	— 16
Inventory 1/1	138,000	124,000	— 10
Inventory 12/31	124,000	73,000	— 41
Inventory Change	—14,000	—51,000	

UNBLEACHED SULFITE PULP

	1944	1945	% Change
Capacity	1,095,372	1,062,345	— 3
Consumption	1,241,966	1,237,907	0
New Supply	1,216,106	1,446,740	+ 19
Production	862,928	816,443	— 5
Imports	399,418	657,297	+ 65
Shipments	239,964	234,411	— 2
Export	46,240	27,000	— 42
Domestic	193,724	207,411	+ 7
Inventory 1/1	72,000	44,000	— 39
Inventory 12/31	44,000	253,000	+475
Inventory Change	—28,000	+209,000	

These tables were issued by U. S. Pulp Producers Association. All figures are in short tons. U. S. government figures are used for production and consumption of major grades and for imports, exports (except two months), and 1944 and 1/1/45 inventories. The association estimated exports for last two months of 1945 and inventories for 12/31/45 and compiled capacity data and domestic shipments from its own reports. It also incorporated its own production and consumption figures for dissolving and semi-chemical (non-paper) grades.

TOTAL SULFATE PULP

	1944	1945	% Change
Capacity	5,161,694	5,298,790	+ 3
Consumption	4,588,463	4,675,711	+ 2
New Supply	4,582,455	4,854,397	+ 6
Production	4,548,810	4,468,969	— 2
Imports	146,015	452,428	+210
Shipments	489,918	412,228	— 16
Export	112,370	67,000	— 40
Domestic	377,548	345,228	— 9
Inventory 1/1	67,000	66,000	— 1
Inventory 12/31	66,000	246,000	+273
Inventory Change	—1,000	+180,000	

SODA PULP

	1944	1945	% Change
Capacity	481,653	494,866	+ 3
Consumption	418,442	440,467	+ 5
New Supply	418,578	440,340	+ 5
Production	412,755	430,183	+ 4
Imports	16,404	21,157	+ 29
Shipments	107,273	94,670	— 12
Export	10,581	11,000	+ 4
Domestic	96,692	83,670	— 13
Inventory 1/1	15,000	16,000	+ 7
Inventory 12/31	16,000	16,000	0
Inventory Change	+1,000	0	

BLEACHED SULFATE PULP

	1944	1945	% Change
Capacity	699,875	783,244	+ 12
Consumption	713,747	756,265	+ 6
New Supply	705,707	770,267	+ 9
Production	664,946	704,271	+ 6
Imports	47,458	71,996	+ 52
Shipments	96,432	113,285	+ 17
Export	6,697	6,000	— 10
Domestic	89,735	107,285	+ 20
Inventory 1/1	24,000	22,000	— 8
Inventory 12/31	22,000	36,000	+ 64
Inventory Change	—2,000	+14,000	

SEMICHEMICAL PULP

	1944	1945	% Change
Capacity	357,425	375,795	+ 5
Consumption	307,619	324,576	+ 6
New Supply	307,619	324,576	+ 6
Production	307,619	324,576	+ 6
Imports	0	0	
Shipments	701	0	—
Exports	0	0	
Domestic	701	0	
Inventory 1/1	0	0	
Inventory 12/31	0	0	
Inventory Change	0	0	

SEMIBLEACHED SULFATE PULP

	1944	1945	% Change
Capacity	171,165	166,765	— 3
Consumption	156,085	167,537	+ 7
New Supply	156,262	167,942	+ 7
Production	144,262	147,942	+ 3
Imports	12,000	20,000	+ 67
Shipments	9,876	6,538	— 34
Export	0	0	0
Domestic	9,876	6,538	— 34
Inventory 1/1	4,000	5,000	+ 25
Inventory 12/31	5,000	6,000	+ 20
Inventory Change	+1,000	+1,000	

GROUNDWOOD PULP

	1944	1945	% Change
Capacity	2,177,114	2,212,237	+ 2
Consumption	1,830,175	1,905,660	+ 4
New Supply	1,815,648	1,920,161	+ 6
Production	1,638,761	1,697,451	+ 4
Imports	176,887	222,710	+ 26
Shipments	50,055	52,002	+ 4
Export	0	0	0
Domestic	50,055	52,002	+ 4
Inventory 1/1	61,000	41,000	— 33
Inventory 12/31	41,000	55,000	+ 34
Inventory Change	—20,000	+14,000	

UNBLEACHED SULFATE PULP

	1944	1945	% Change
Capacity	4,290,654	4,348,781	+ 1
Consumption	3,718,631	3,751,909	+ 1
New Supply	3,720,486	3,916,188	+ 5
Production	3,739,602	3,616,756	— 3
Imports	86,557	360,432	+316
Shipments	383,610	292,405	— 24
Export	105,673	61,000	— 42
Domestic	277,937	231,405	— 17
Inventory 1/1	39,000	39,000	0
Inventory 12/31	39,000	204,000	+423
Inventory Change	0	+165,000	

DEFIBRATED, EXPLODED and ASPLUND FIBER

	1944	1945	% Change
Capacity	715,374	743,530	+ 4
Consumption	660,933	683,580	+ 3
New Supply	662,668	690,717	+ 4
Production	662,668	690,717	+ 4
Imports	0	0	
Shipments	0	0	—
Export	0	0	
Domestic	0	0	
Inventory 1/1	1,000	2,000	+100
Inventory 12/31	2,000	9,000	+350
Inventory Change	+1,000	+7,000	

STAINLESS STEEL PIPE FITTINGS by ESCO

ESCO stainless steel pipe fittings are made of the same Esco alloy 45 that is used with such good results in pulp mills throughout the United States and Canada. Teamed with Esco stainless pipe, they resist corrosion and reduce piping maintenance to the minimum.

Esco screwed pipe fittings are available in sizes from 1/8" to 3"—in 90- and 45-degree elbows, tee, cross, union, coupling, reducer, cap, plug, bushing and locknut. Complete range of sizes are carried in warehouse stock.

Esco flanged pipe fittings range in size from 1/2" to 10". Available in 90- and 45-degree elbows, tee, long radius ell, 45-degree lateral, and reducer.

Faces are accurately machined to insure perfect gasket seat. Esco socket-weld fittings, when used according to recommendations of Esco engineers, have made substantial savings by eliminating unnecessary weight. Sizes of socket-weld fittings are from 1" to 14". Available in 90- and 45-degree elbows, tee, 45-degree lateral, coupling.

Engineering Facilities Available to You...

Esco engineers have had years of experience in designing equipment for the pulp industry. You are invited to consult with them on any technical problem concerning the operation of your mill. Write us about your problem, and our facilities will be placed at your disposal.

ELECTRIC STEEL FOUNDRY

2141 N. W. 25th Avenue • Portland 10, Oregon

ESCO STAINLESS STEELS FOR ULTIMATE ECONOMY

FOR DETAILED INFORMATION ON ESCO STAINLESS STEEL Products ...write for Esco bulletin 155 and 157.

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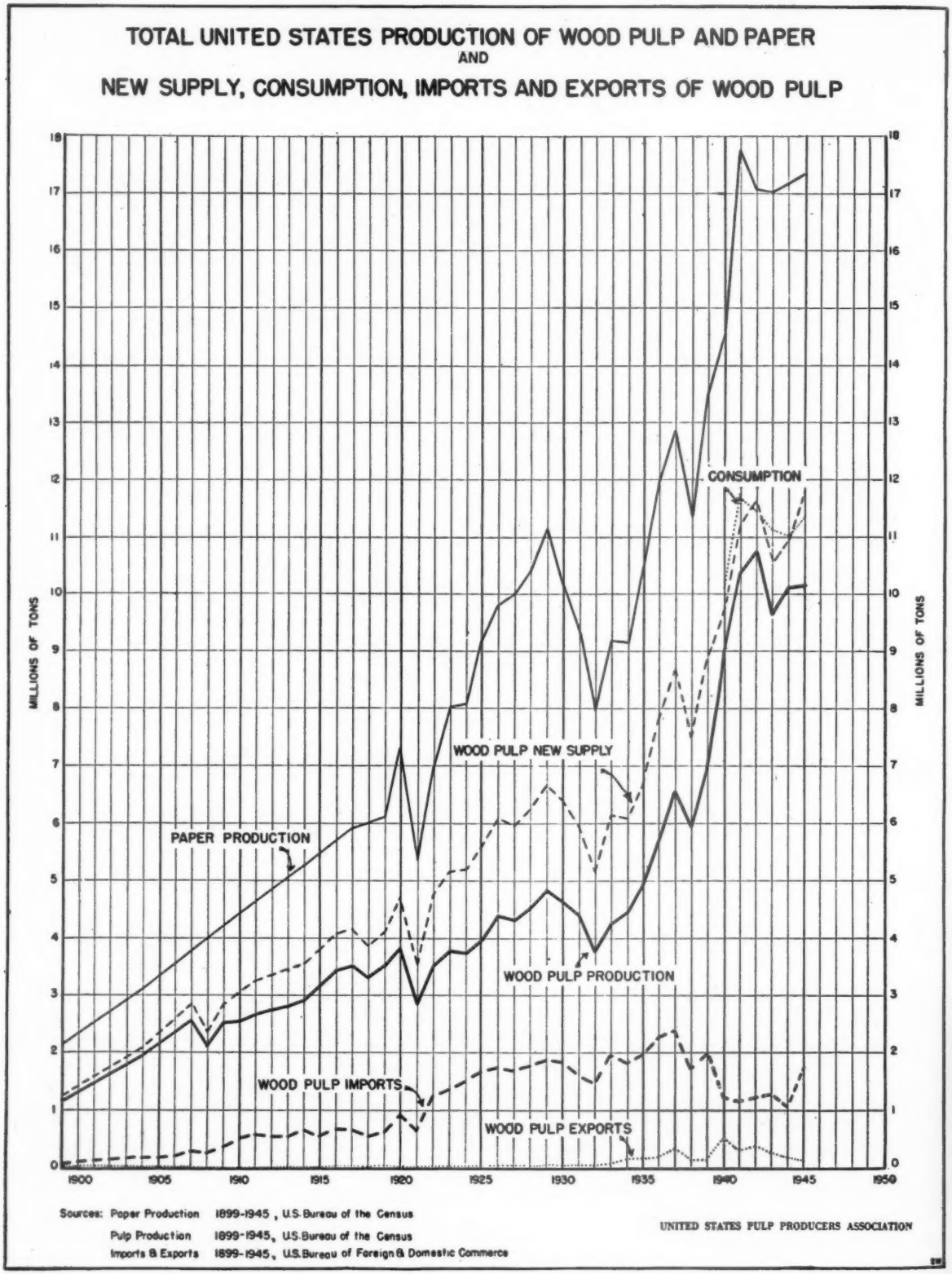

TOTAL UNITED STATES PRODUCTION OF WOOD PULP AND PAPER
AND
NEW SUPPLY, CONSUMPTION, IMPORTS AND EXPORTS OF WOOD PULP
MILLIONS OF TONS
MILLIONS OF TONS
CONSUMPTION
WOOD PULP NEW SUPPLY
PAPER PRODUCTION
WOOD PULP PRODUCTION
WOOD PULP IMPORTS
WOOD PULP EXPORTS
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
Sources: Paper Production 1899-1945, U.S. Bureau of the Census
Pulp Production 1899-1945, U.S. Bureau of the Census
Imports & Exports 1899-1945, U.S. Bureau of Foreign & Domestic Commerce
UNITED STATES PULP PRODUCERS ASSOCIATION

IN 1945 SWEDISH PRICES IN THE U. S. RESUMED AT APPROXIMATELY THE 1941 LEVELS SHOWN IN CHART BELOW AND THEN ANNOUNCEMENT CAME ON APRIL 11, 1946, OF INCREASES OF ABOUT 10%.

However, the 1945 prices would be shown just a shade below where these chart lines leave off. The Swedes are compelled to sell at O.P.A. prices and on what amounts to a delivered basis, so that they were not able in 1945 to make an east coast dock quotation strictly comparable to the quotations made in the years preceding the war and as indicated on this chart.

The Swedish price in 1945 and early 1946 in the U. S. was the domestic ceiling price east coast dock, with the seller required to absorb up to $7.00 inland freight. Therefore, in the case of bleached sulphite, their price was $86.00, and their average backhaul freight actually absorbed about $4.00, so that they ended up with an average east coast dock return of $82.00. While they were forced to quote the same price to all buyers, they actually received a different net price east coast dock from each buyer depending upon the backhaul which they had to absorb up to a maximum of $7.00.

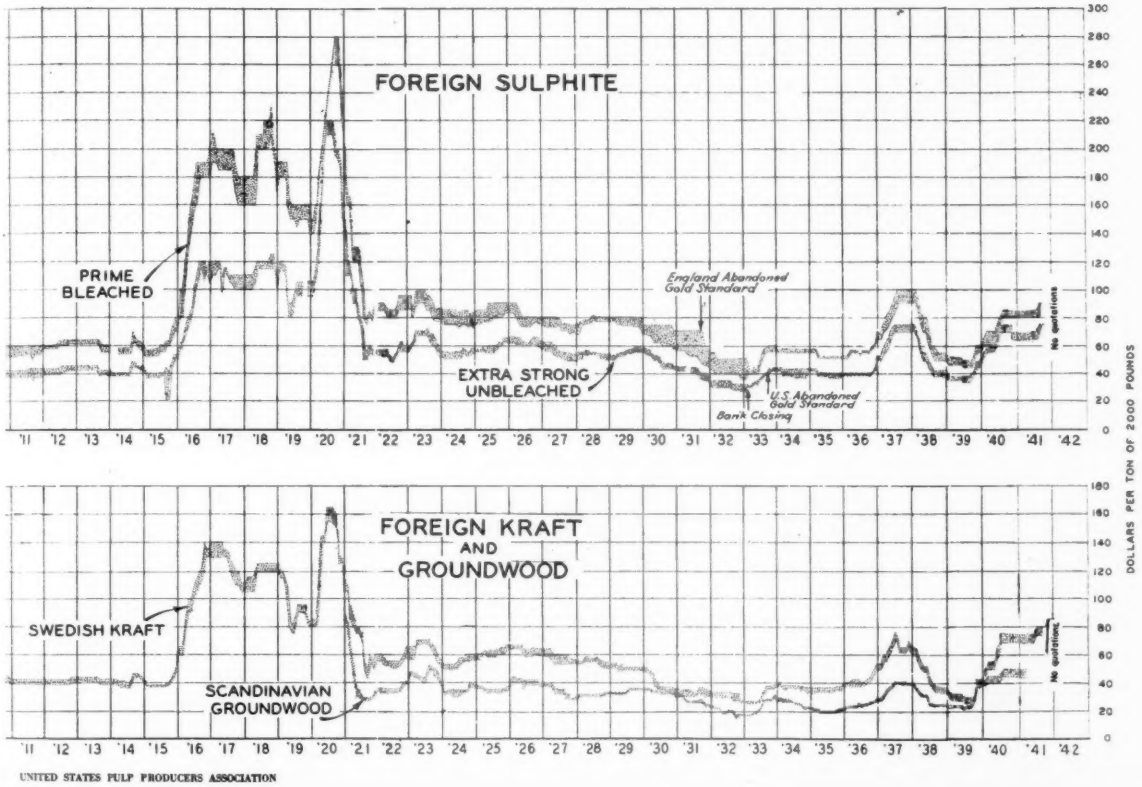
In the price raise announced April 11, the bleached sulfite price went to $94. The Swedes also benefited by a $3 reduction from maximum in backhaul freight and their average backhaul cost is $3. They end up with an average east coast dock return of $91 under the new price set-up. Here follows the 1945-early 1946 prices and the new 1946 prices for the grades shown in the chart below, with the right hand column representing the figure comparable with those in the chart.

Grade	Under Prices Early 1944-Early 1946 — Delivered Price	Under Prices Early 1944-Early 1946 — East Coast Dock Equivalent	Under Prices Announced 4/11/46 — Delivered Price	Under Prices Announced 4/11/46 — East Coast Dock Equivalent
Bleached Sulphite	$86.00	$82.00	$94.00	$91.00
Strong Unbleached	74.00	70.00	82.00	79.00
Swedish Unbleached Kraft	73.00	69.00	82.00	79.00
Groundwood (regular)	50.00	46.00	58.00	55.00

The average backhaul absorption is about $4.00. It may have been slightly higher on groundwood because they shipped in some wet tonnage.

FOREIGN WOOD PULP PRICE TRENDS

SPOT QUOTATIONS, EX-DOCK, FIRST WEEK OF EACH MONTH


FOREIGN SULPHITE
PRIME BLEACHED
EXTRA STRONG UNBLEACHED
England Abandoned Gold Standard
U.S. Abandoned Gold Standard
Bank Closing
No quotations
FOREIGN KRAFT AND GROUNDWOOD
SWEDISH KRAFT
SCANDINAVIAN GROUNDWOOD
DOLLARS PER TON OF 2000 POUNDS
'11 '12 '13 '14 '15 '16 '17 '18 '19 '20 '21 '22 '23 '24 '25 '26 '27 '28 '29 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40 '41 '42

UNITED STATES PULP PRODUCERS ASSOCIATION

FLUCTUATIONS OF BLEACHED SULFITE PULP PRICES IN U. S.

The chart shows how bleached sulfite prices carried along at $80 in late '20s, took deep dips in the 1930's—as low as $35—which was a serious threat to existence of U. S. mills. First increase in OPA fixed prices in 3½ years of war period was in early 1944, when price went to $86. Then came the increases announced Apr. 11, 1946, which boosted this price for bleached sulfite to $94.

NEW PULP PRICES

The long-awaited and fought-for break in OPA woodpulp ceilings—the first since early 1944—cracked on April 11 with an announcement of increases in producers prices of nearly 10 per cent affective Apr. 22.

The action was taken by OPA on the basis of assurances that it would materially increase pulp supply.

Grade	Old Price	New Price
Bleached softwood sulfite	$86.00	$94.00
Unbl. softwood sulfite	74.00	82.00
Bleached hardwood sulfite	83.50	91.50
Unbl. hardwood sulfite	71.50	79.50
Northern bleached sulfate	86.00	94.00
Southern bleached sulfate	79.00	88.00
Northern semi-bl. sulfate	82.00	89.00
Southern semi-bl. sulfate	75.00	83.00
Northern unbl. sulfate	73.00	82.00
Bleached soda pulp	76.00	84.00
Unbleached soda	72.00	80.00
Groundwood	50.00	58.00
Gr'd., paper machine dried	53.00	61.00

Screenings, sulfite-sulfate and groundwood are raised $2.00 per ton. Side runs will take the same increase as corresponding grades listed above. Standard newsprint side runs are raised to $58.00 from $50.00. The order will carry specific raises for special types such as glassine pulps and they will carry increases corresponding to the grades listed above.

SUMMARY FOR 1945* OF UNITED STATES WOOD PULP PRODUCTION, SHIPMENTS *and* STOCKS

(Tons of 2,000 lbs., air dry weight)

	Production	Used**	Shipments Domestic Market	Shipments Export	Stocks on Hand** End of Period 12/31/45	Stocks on Hand** End of Period 1/1/45
Total All Grades, 1945	9,494,888	7,905,514	1,451,072	133,954	71,195	66,847
Total Bleached Sulphite	1,539,086	772,700	734,315	27,327	17,105	12,361
Total Unbleached Sulphite	818,733	587,122	205,456	24,863	9,461	8,169
Total Bleached Sulphate	838,259	716,286	113,385	8,751	3,999	4,162
Total Unbleached Sulphate	3,639,023	3,346,826	231,391	62,557	8,894	10,645
Total Soda	443,236	349,848	83,670	10,123	1,933	2,338
Semi-Chemical	324,576	324,511	0	0	137	72
Groundwood	1,697,451	1,643,908	52,642	0	26,481	25,580
Screenings and Off Quality	194,524	164,313	30,213	333	3,185	3,520

*All grades of wood pulp except defibrated, exploded and asplund.
**Covers only pulp manufactured by producing mills or transferred to their subsidiaries. Does not include purchased pulp.

Source: As reported to the United States Pulp Producers Assn. by companies producing 99% of the 1945 United States pulp production.

SUMMARY FOR 1944 OF UNITED STATES WOOD PULP PRODUCTION, SHIPMENTS *and* STOCKS

(Tons of 2,000 lbs., air dry weight)

	Production	Used*	Shipments Domestic Market	Shipments Export	Stocks on Hand* End of Period 12/31/44	Stocks on Hand* End of Period 1/1/44
Total All Grades, 1944**	9,466,826	7,783,146	1,495,015	183,540	66,847	61,722
Total Bleached Sulphite	1,522,164	742,330	749,316	28,742	12,361	10,585
Total Unbleached Sulphite	865,938	635,974	193,724	35,741	8,169	7,670
Total Bleached Sulphate	792,974	686,461	99,611	6,288	4,162	3,548
Total Unbleached Sulphate	3,732,849	3,347,254	277,937	104,993	10,645	7,980
Total Soda	426,197	322,161	96,692	7,776	2,338	2,770
Semi-Chemical	307,619	306,918	701	0	72	72
Groundwood	1,637,241	1,588,268	50,055	0	25,580	26,662
Total Screenings	181,844	153,780	26,979	0	3,520	2,435

*Covers only pulp manufactured by producing mills or transferred to their subsidiaries. Does not include purchased pulp.
**All grade of wood pulp except defibrated, exploded and asplund fiber.

Source: As reported to the U. S. Pulp Producers Association by all chemical pulp producing companies and 99% of the groundwood pulp producing companies.

SUMMARY FOR 1943 OF UNITED STATES WOOD PULP PRODUCTION, SHIPMENTS *and* STOCKS

(Tons of 2,000 lbs., air dry weight)

	Production	Used*	Shipments Domestic Market	Shipments Export	Stocks on Hand End of Period 12/31/43	Stocks on Hand End of Period 1/1/43
Total All Grades, 1943	9,070,157	7,579,474	1,313,067	260,326	61,384	143,993
Total Bleached Sulphite	1,557,729	798,604	710,340	59,582	10,585	21,382
Total Unbleached Sulphite	885,251	628,756	194,311	72,095	7,670	17,581
Total Bleached Sulphate	746,235	689,951	53,296	8,395	3,548	8,955
Total Unbleached Sulphate	3,501,193	3,217,982	211,119	114,362	7,980	50,250
Total Soda	419,186	327,011	87,944	5,000	1,770	3,539
Semi-Chemical	231,874	231,920	35	0	72	153
Chemical Screenings	13,979	6,354	7,026	602	1,738	1,741
Groundwood	1,711,862	1,675,659	48,859	290	26,678	39,624
Groundwood Screenings	2,848	3,136	137	0	343	768

Source: United States Pulp Producers Association.
*Covers only pulp manufactured by producing mills or transferred to their subsidiaries. Does not include purchased pulp.

THE MEAD SALES COMPANY
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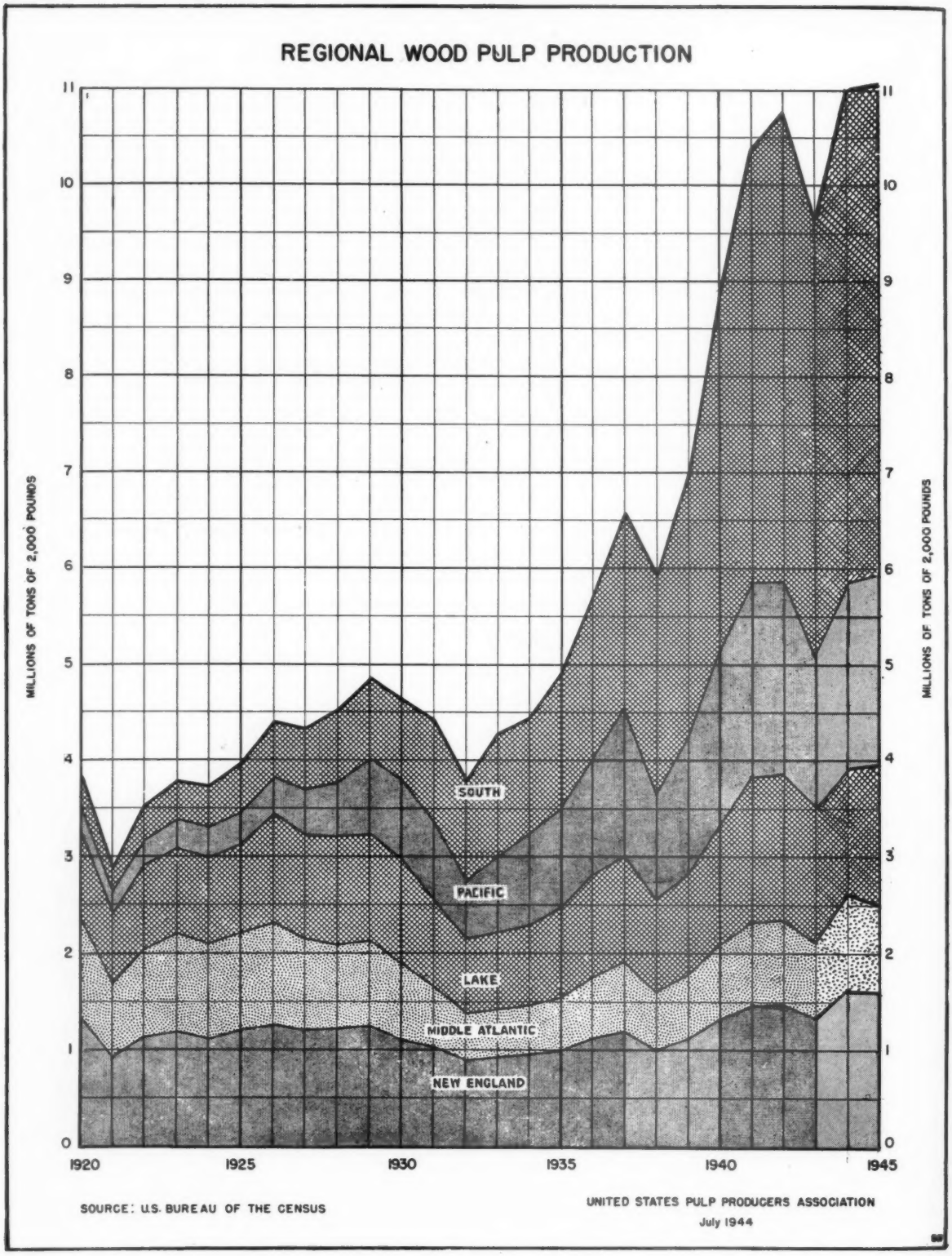
111 W. WASHINGTON STREET, CHICAGO 2, ILL.

MEAD
pulp

DISTRIBUTORS OF WOOD PULP
BLEACHED AND UNBLEACHED
CHEMICAL AND MECHANICAL WOOD PULP

A giant fir was tinder in the arms of Paul Bunyan, as he and Babe headed back to camp after a day's logging.

A reproduction of this incident from the fabulous life of Paul Bunyan—the fifth of a series—will be sent on request. It will contain no advertising.


REGIONAL WOOD PULP PRODUCTION
MILLIONS OF TONS OF 2,000 POUNDS
MILLIONS OF TONS OF 2,000 POUNDS
0
1
2
3
4
5
6
7
8
9
10
11
1920
1925
1930
1935
1940
1945
SOUTH
PACIFIC
LAKE
MIDDLE ATLANTIC
NEW ENGLAND
SOURCE: U.S. BUREAU OF THE CENSUS
UNITED STATES PULP PRODUCERS ASSOCIATION
July 1944

TOTAL UNITED STATES PRODUCTION OF WOOD PULP
By Grades — 1925-1945
(Tons of 2000 pounds)

Year.	Total	Unbleached Sulphite	Bleached Sulphite	Total Sulphate	Groundwood	Soda	All Other
1925	3,962,217	790,510	612,576	409,768	1,612,019	472,647	64,697
1926	4,394,766	911,729	646,466	519,960	1,764,248	496,920	55,463
1927	4,313,403	872,411	680,288	603,253	1,610,409	487,478	59,564
1928	4,510,800	836,751	722,107	774,225	1,610,988	488,641	78,088
1929	4,862,885	848,754	839,953	910,888	1,637,653	520,729	104,908
1930	4,630,308	815,897	751,166	949,513	1,560,221	474,230	79,281
1931	4,409,344	675,859	740,812	1,034,291	1,449,240	374,054	135,088
1932	3,760,267	548,702	596,937	1,028,846	1,203,044	290,703	92,035
1933	4,276,204	601,102	726,473	1,259,351	1,197,553	457,790	33,935
1934	4,281,428	599,905	806,612	1,240,967	1,253,398	477,089	35,457
1935	5,032,299	634,947	944,620	1,467,749	1,355,819	485,162	144,002
1936	5,695,219	693,903	1,127,039	1,794,734	1,475,620	557,695	46,228
1937	6,713,576	791,575	[1]1,348,669	2,139,087	1,600,667	507,548	326,030
1938	5,933,560	601,855	[2]1,004,621	2,443,057	1,333,308	395,307	155,418
1939	6,993,000	729,000	1,217,000	2,963,000	1,445,000	442,000	198,000
1940	8,960,000	996,000	1,612,000	3,748,000	1,579,000	532,000	493,000
1941	10,375,000	1,216,000	1,703,000	4,527,000	2,152,000	480,000	663,000
1942	10,783,000	1,213,000	1,717,000	4,738,000	1,756,000	462,000	897,000
1943	9,680,000	883,000	1,553,000	4,236,000	1,638,000	419,000	951,000
1944	10,108,000	863,000	1,523,000	4,549,000	1,639,000	413,000	1,122,000
1945	10,165,000	816,000	1,542,000	4,469,000	1,697,000	430,000	1,210,000

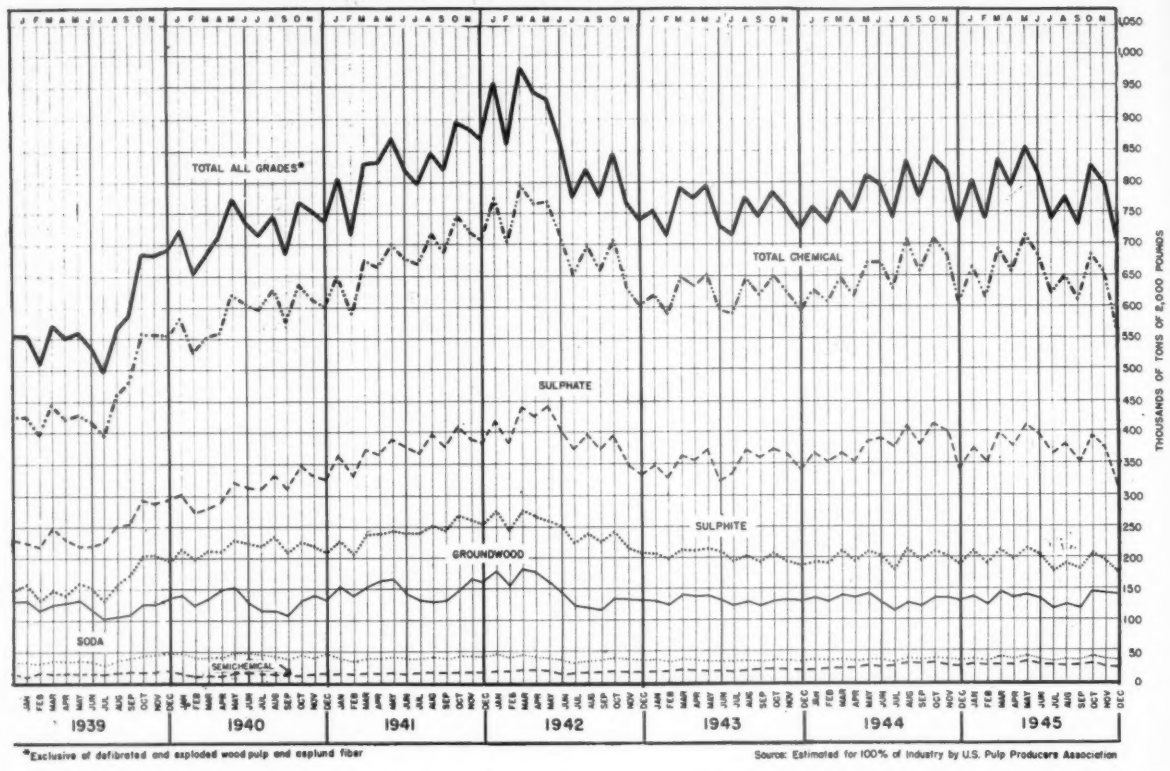
Source: Bureau of the Census.
1925 through 1939, data on "defibrated, etc." included in "Groundwood" and thereafter in "All Other."

WOOD PULP: Production in Selected Countries, 1929-39
(Thousands of Short Tons)

Country	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939 a/
Europe:											
Great Britain--	129	113	108	102	111	121	125	129	222	218	180
Sweden---------	2,800	2,680	2,423	2,201	2,824	3,163	3,278	3,506	3,884	3,374	3,457
Norway---------	1,056	1,027	608	992	942	1,083	949	1,094	1,208	992	990
Finland--------	1,072	1,186	1,195	1,392	1,520	1,728	1,904	2,178	2,415	2,444	1,780
Germany--------	2,296	2,249	1,944	1,843	1,912	2,178	2,315	2,540	2,737	2,715	2,800
Russia---------	305	423	451	481	533	579	651	773	924	1,070	950
Austria--------	362	349	344	312	342	351	370	371	456	400	380
France---------	165	183	180	186	252	320	353	375	393	375	400
Czechoslovakia-	357	360	360	239	288	319	310	348	379	350	350
Italy----------	133	139	149	152	138	124	146	153	208	229	200
Poland---------	120	119	107	103	109	135	136	168	191	214	170
Netherlands----	101	101	100	106	108	111	116	117	133	115	120
Estonia--------	75	81	91	84	86	92	93	93	95	100	100
Switzerland----	83	85	74	73	77	85	80	79	99	77	100
Rumania--------	42	47	41	35	38	51	55	60	62	66	65
Lithuania b/---	64	61	43	40	55	64	62	68	76	64	70
Latvia---------	23	27	7	17	24	25	29	36	44	49	40
Yugoslavia-----	---	---	---	---	---	8	9	10	37	30	35
Hungary--------	---	4	4	4	5	6	7	6	7	11	7
Turkey---------	---	---	---	---	---	---	---	1	8	9	9
Denmark--------	---	4	4	4	6	7	7	6	7	7	7
Bulgaria-------	---	---	---	---	---	---	---	2	3	6	4
Total above--	9,183	9,238	8,233	8,416	9,370	10,550	10,995	12,113	13,588	12,915	12,214
Canada---------	4,021	3,619	3,168	2,663	2,980	3,636	3,868	4,485	5,141	3,668	4,166
Newfoundland---	231	288	281	263	266	306	331	322	353	267	350
United States--	4,863	4,630	4,409	3,760	4,276	4,436	4,926	5,695	6,573	5,934	6,993
TOTAL----------	18,298	17,775	16,091	15,102	16,892	18,928	20,120	22,615	25,655	22,784	23,723

a/ Estimated except for Canada, United States, Finland and Sweden.
b/ Estimated
Source: 1929-1938 United States Pulp Producer's Association, Wood Pulp Statistics, July 1944.

UNITED STATES WOOD PULP PRODUCTION



*Exclusive of defibrated and exploded wood pulp and asplund fiber

Source: Estimated for 100% of industry by U.S. Pulp Producers Association

U. S. CONSUMPTION OF WOOD PULP AND OTHER FIBROUS MATERIALS IN MANUFACTURE OF PAPER AND PAPERBOARD

Type of material:	Consumption in tons of 2,000 pounds					
	1940	1941	1942	1943 (2)	1944 (1)	1945 (3)
All types	15,492,808	18,856,286	17,857,930	18,199,442	18,746,762	18,970,706
Wood pulp, total	9,781,739	11,363,600	11,038,020	10,635,320	10,502,204	10,822,633
Groundwood	1,862,575	2,218,808	1,926,099	1,854,776	1,830,175	1,905,660
Defibrated, exploded, asplund fiber & similar grades	276,413	346,381	527,072	639,276	660,933	683,580
Sulfite, total	2,906,794	3,348,476	3,079,227	2,891,719	2,518,590	2,583,934
Unbleached	1,348,951	1,543,146	1,581,152	1,449,419	1,241,966	1,237,907
Bleached	1,557,843	1,805,330	1,498,075	1,442,300	1,276,624	1,346,027
Sulphate, total	3,964,729	4,613,905	4,632,640	4,430,098	4,588,463	4,675,711
Unbleached	3,292,130	3,710,405	3,801,610	3,583,851	3,718,631	3,751,909
Semibleached	178,405	207,884	164,384	163,066	156,085	167,537
Bleached	494,194	695,616	666,646	683,181	713,747	756,265
Soda, total	531,581	515,389	468,661	455,892	418,442	440,467
Semi-chemical, off quality screenings, etc.	239,647	320,641	404,321	363,559	485,601	533,281
Other fibrous materials, total	5,711,069	7,492,686	6,819,910	7,564,122	8,244,558	8,148,073
Waste paper	4,667,502	6,075,129	5,494,959	6,367,854	6,859,332	6,801,080
Rags	402,600	529,976	480,614	425,910	427,837	415,804
Straw	491,821	666,493	516,087	488,266	556,714	520,311
Manila fiber, old rope	20,187	27,396	28,205	12,921	9,103	7,201
Other fiber	128,959	193,692	300,045	269,171	391,572	403,677

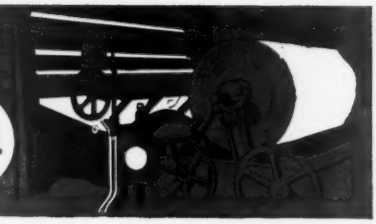
Source: Compiled by the Bureau of the Census from the reports received from the Pulp Allocation Office, U. S. War Production Board.

(1) Includes estimates of materials consumed by 22 mills which did not submit monthly reports for one or more months during 1944. The estimates were made for each mill by computing the ratio of materials consumed to paper and paperboard produced for all months for which such information was available, and applying these ratios to reported paper and paperboard production in months for which consumption data were not reported. The proportion of estimate for all types of materials, with the exception of manila and old rope (5.0 per cent), was less than one per cent.

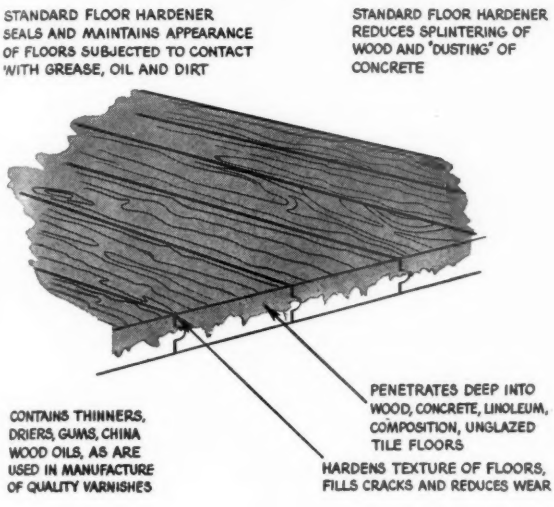
(2) Includes estimates for materials consumed by 71 mills which did not submit monthly reports for one or more months during 1943. The estimates were made in the same manner as outlined in footnote (1).

(3) Preliminary. These data are estimated to give 100 per cent coverage of the industry. The over-all proportion of estimate for all types of wood pulp for the year 1945 is 1.2 per cent. In no case does the proportion of estimate for any of the several grades of wood pulp exceed 3 per cent. The over-all proportion of estimate for all other types of fibrous materials for the year 1945 is 1.2 per cent. With the exception of the data for straw which contain a 2.1 per cent estimate for the year 1945, the proportions of estimate for the other fibrous materials do not exceed 1.5 per cent.

STANDARD ENGINEERS NOTEBOOK



Hardener lengthens life of plant floors


STANDARD FLOOR HARDENER SEALS AND MAINTAINS APPEARANCE OF FLOORS SUBJECTED TO CONTACT WITH GREASE, OIL AND DIRT
STANDARD FLOOR HARDENER REDUCES SPLINTERING OF WOOD AND 'DUSTING' OF CONCRETE
CONTAINS THINNERS, DRIERS, GUMS, CHINA WOOD OILS, AS ARE USED IN MANUFACTURE OF QUALITY VARNISHES
PENETRATES DEEP INTO WOOD, CONCRETE, LINOLEUM, COMPOSITION, UNGLAZED TILE FLOORS
HARDENS TEXTURE OF FLOORS, FILLS CRACKS AND REDUCES WEAR

Where maintenance of floors is a problem because of excessive use, wear from grit, contact with grease, oil, fruit juices or discoloration, Standard Floor Hardener is recommended.

Made from special petroleum oils, wood oils, gums and thinners, most of which are used in making a quality varnish, Standard Floor Hardener penetrates deeply, hardens wood, concrete, linoleum, composition flooring and unglazed tile. It should not be used on any rubber or asphaltic product.

Standard Floor Hardener provides a hard, non-slippery surface that prevents absorption of dirt, grease, etc., and makes cleaning much easier and faster. It stops excessive splintering and chipping of wood and "dusting" of concrete.

Because a gallon of Standard Floor Hardener covers up to 600 square feet, it is economical. It may be thinned as much as 25 percent with Standard Compounded Paint Thinner.

Proper oil solves steam engine lubrication problems

Steam Engine Types and Operating Conditions	Lubricant	Steam Engine Types and Operating Conditions	Lubricant	Steam Engine Types and Operating Conditions	Lubricant	Steam Engine Types and Operating Conditions	Lubricant
Low pressure, saturated steam where rapid atomization required. Pressures up to 100 lb. gauge.	CALOL CYLINDER OIL—95X (Low vis., compounded)	Marine reciprocating engines without condensers — fresh water easily obtained. Pressures up to 150 lbs. and excessive moisture conditions.	CALOL VALVE OIL—125FX (Med. vis., heavily compounded, filtered)	Saturated or slight super-heat steam with pressures around 150 lbs.—condensate returned to boilers for ice manufacture or heating. Marine reciprocating engines with condensers.	CALOL CYLINDER OIL—160 (Med.-high vis., straight mineral)	Normal wet and moderate super-heat steam. Pressures to 225 lbs. gauge; temperatures to 550° F.	CALOL CYLINDER OIL—155PX (Med.-high vis., compounded 100% Pennsylvania)
Stationaries, donkeys, pumps, units using dry and saturated steam. Pressures to 150 lb. gauge; temperatures to 370° F.	CALOL CYLINDER OIL—130X (Med. vis., compounded)	Condensing-steam, heating and distilled-water-ice plants, etc., where rapid separation from water necessary. Pressures to 160 lb. gauge; temperatures to 375° F.	CALOL CYLINDER OIL—135FX (Med., vis., lightly compounded, filtered)	High-speed or heavily loaded engines. Pressures to 150 lbs. gauge; temperatures up to 400° F.	CALOL CYLINDER OIL—125PX (Med. vis., compounded Pennsylvania)	Pressures to 160 lbs. gauge; temperatures to 450° F. For same conditions as Calol Cylinder Oil — 135FX when non-compounded oil desired. Marine reciprocating engines with condensers.	CALOL CYLINDER OIL—150P (Med. vis., uncompounded Pennsylvania)
Stationaries, donkeys, pumps, locomotives, etc. —excessive moisture at throttle. Pressures up to 150 lbs.; temperatures up to 370° F.	CALOL VALVE OIL—130X (Med. vis., heavily compounded)	Steam cylinders. Pressures from 140 lb. gauge to 200 lb. gauge; temperatures up to 450° F.	CALOL CYLINDER OIL—155X (Med.-heavy vis., compounded)	Dry and saturated steam and slight moisture conditions. Pressures to 160 lbs. gauge; temperatures to 450° F.	CALOL CYLINDER OIL—140PX (Med. vis., compounded 100% Pennsylvania)	Corliss, poppett and piston-valve type engines and locomotives. Dry, saturated and high super-heat steam. Pressures over 160 lb. gauge; temperatures to 700° F.	CALOL CYLINDER OIL—190PX (High vis., compounded 100% Pennsylvania)

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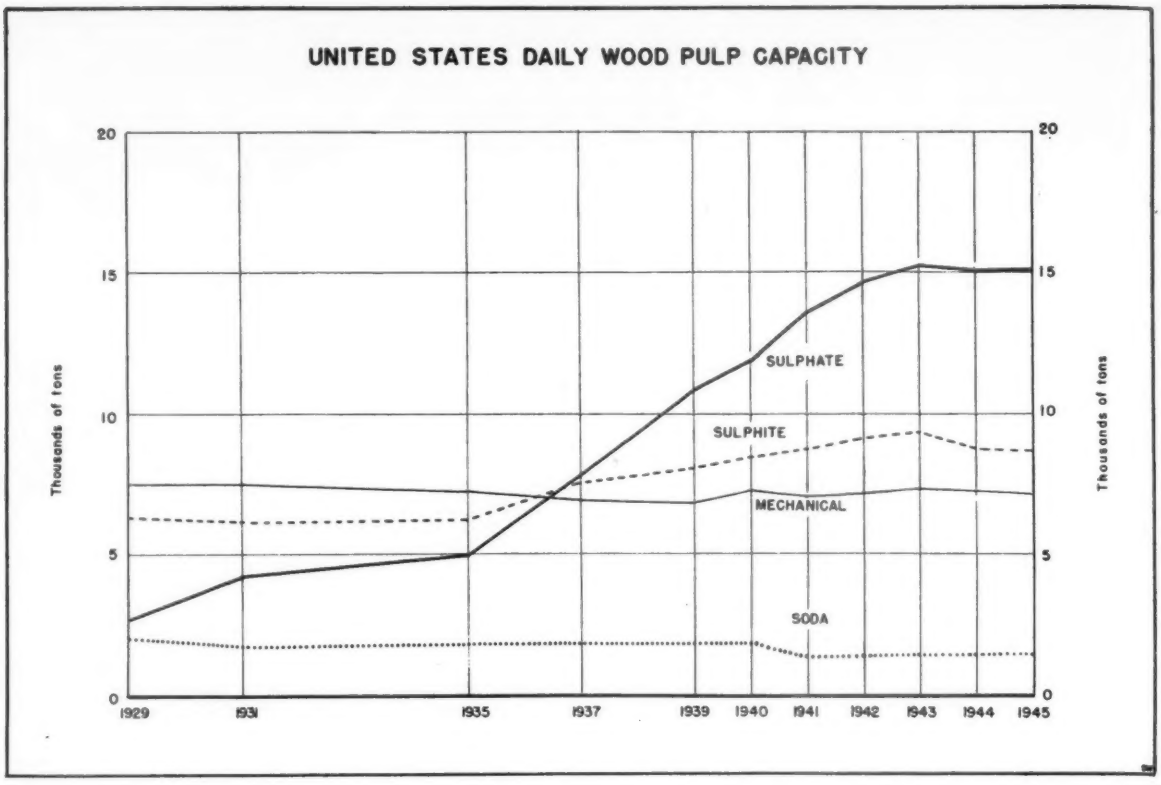


Total Rated Capacity per 24 Hours (In tons of 2000 pounds)

	Sulphite	Sulphate	Soda	Semi-Chemical	Mechanical	Total*
1929	6,357	2,740	2,037	155**	7,587	18,876
1931	6,115	4,224	1,751	320**	7,524	19,934
1935	6,243	4,926	1,841	320**	7,217	20,547
1937	7,558	7,852	1,830	433**	6,973	24,646
1939	8,145	10,866	1,814	499	6,848	28,172
1940	8,464	11,853	1,922	592	7,251	30,082
1941	8,754	13,578	1,410	637	7,084	31,463
1942	9,112	14,609	1,475	687	7,184	33,067
1943	9,303	15,230	1,462	734	7,328	34,057
1944	8,798	15,044	1,461	1,063	7,228	33,594
1945	8,693	I5,077	1,465	1,063	7,115	33,413

* Data do not include capacity for defibrated, exploded and asplund fiber.

** Estimated from Government figures which combined capacity for Semi-chemical wood pulp with capacity for cotton linters, rag pulp, etc.

Sources: 1929-1940, United States Bureau of the Census
1941-1945, United States Pulp Producers Association's Surveys of capacity as of the first of each year.

Where to find pulp data: Canadian, 73, 102, 104. U. S. Regional, 84, 92, 97, 99, 100, 101. Exports-Imports, 73, 74, 85-88, 101, 104-6, 108, 144. Production, 73, 84-88, 90-94, 84-94, 100-1. Prices, 89, 90. Consumption, 85-88, 94. Capacities, 85, 86, 96, 97, 98.

UNITED STATES WOOD PULP PRODUCING CAPACITY BY REGIONS

(In tons of 2,000 pounds)

1944	New Eng.	Mid. Atl.	Lake	Pacific	South	Total
Sulphite	607,380	332,610	648,331	1,191,869	126,550	2,906,740
Bleached*	367,570	183,750	405,738	727,760	126,550	1,811,368
Unbleached	239,810	148,860	242,593	464,109	0	1,095,372
Sulphate	32,000	73,250	318,460	457,375	4,280,609	5,161,694
Bleached*	0	62,400	28,200	67,040	542,235	699,875
Semibleached	0	0	33,465	17,660	120,040	171,165
Unbleached	32,000	10,850	256,795	372,675	3,618,334	4,290,654
Soda	141,718	159,005	51,820	5,580	123,530	481,653
Semichemical	0	0	0	40,200	317,225	357,425
Groundwood	785,860	392,739	457,785	337,680	203,050	2,177,114
Total**	1,566,958	957,604	1,476,396	2,032,704	5,050,964	11,084,626
1945						
Sulphite	610,380	331,970	648,911	1,157,869	126,550	2,875,680
Bleached*	367,570	185,630	406,318	718,760	126,550	1,804,828
Unbleached	242,810	146,340	242,593	439,109	0	1,070,852
Sulphate	32,000	73,250	322,770	457,375	4,305,799	5,191,194
Bleached*	0	62,400	28,200	67,040	542,235	699,875
Semibleached	0	0	33,465	17,660	120,040	171,165
Unbleached	32,000	10,850	261,105	372,675	3,643,524	4,320,154
Soda	142,120	159,623	51,820	5,580	123,530	482,673
Semichemical	0	0	0	40,200	317,225	357,425
Groundwood	783,810	390,065	447,295	337,680	203,050	2,161,900
Total**	1,568,310	954,908	1,470,796	1,998,704	5,076,154	11,068,872

* The following additional bleached capacity was used to produce semibleached or unbleached grades and has therefore been included in those grades:

Sulphite	105,989 tons
Sulphate	296,890 "

** Does not include capacity for defibrated, exploded and asplund fiber, estimated to be approximately 700,000 tons per year.

Note: The above capacity figures are for normal maximum annual capacity (with adequate supplies of wood, labor and transportation), based on daily rated capacity multiplied by the number of days per year each mill is normally operated.

Source: Surveys of Capacity by United States Pulp Producers Association

MARKET WOOD PULP

Estimated U. S. Supply and Consumption Needs—1946

(1,000 short tons)

Item	For paper and paperboard	For nonpaper products	Export	Total
Supply				
U. S. production	750	350	150	1,250
Imports				
Canada and Newfoundland	500	200	.....	700
Sweden, Norway, Finland	1,200	.....	.....	1,200
Total supply	2,450	550	150	3,150
U. S. consumption needs	2,600	550	150	3,300
Apparent deficit	-150	.....	.....	-150

Source: Estimated by Forest Products Section, U. S. Office of Domestic Commerce.

PACIFIC COAST MILL CAPACITIES

(In Tons Per Day)

(These are capacities reported to PULP & PAPER INDUSTRY by United States (Pacific Coast) and British Columbia mills as of May 1 of each year. The table also shows increases and decreases from previous years.)

Pulp—	1941	1942	1943	1944	1945
Unbl. Sulphite	1908	2163(+255)	2178(+ 15)	2228(+ 50)	2437(+209)
Bl. Sulphite	2290	2240(+150)	2340(—100)	2360(+ 20)	2468(+108)
Sulphate	1380	1560(+180)	1600(+ 40)	1600	1540(— 60)
Groundwood	2235	2291(+ 56)	2251(— 40)	2275(+ 24)	2190(— 85)
Soda	65	65	65	75(+ 10)	75
Total Pulp	7878	8519(+641)	8434(— 85)	8538(+104)	8710(+172)
Paper—					
Sulphite	963	1024(+ 61)	922(—102)	922	959(+ 37)
Sulphate	830	850(+ 20)	865(+ 15)	865	865
Newsprint	1805	1756(— 49)	1753(— 3)	1753	1925(+172)
Paperboard	1468	1468	1483(+ 15)	1503(+ 20)	1582(+ 79)
Book Paper	105	95(— 10)	95	105(+ 10)	53(— 52)
Others	705	804(+ 99)	923(+ 94)	911(— 12)	1088(+177)
Total Paper	5876	5997(+121)	6041(+ 44)	6059(+ 18)	6472(+413)

(Continued from Page 84)

market pulp demand alone, would be 440,000 tons under the estimated supply for the period. In this calculation, imports from Canada of 250,000 tons the portion of Canadian imports for mills which did not have their own subsidiaries was placed at only 250,000 tons—150,000 tons less than in the last half of 1945. American mills producing market pulp were expected to ship only 650,000 tons as compared with 710,000 tons in the last half of 1945. The outlook worsened after this prediction was made when winter storms and heavy snows cut back production of some of the biggest western market pulp producers by around 20% for several months.

Still, overall U. S. pulp production was running at a higher rate than in 1945 during the early months of this year. Imports from Canada, also, were running substantially higher than a year ago. Swedish shipments had fallen off to a trickle because of the freeze-up of Baltic shipping ports and there was no prospect of increase until the thaw in May, regardless of what might be done about price.

One fact was obvious enough—the price increases had immediately brightened the pulp outlook considerably and may assure the United States of imports which might reach 2,400,000 tons for the year.

All-Time Record

According to the wood pulp data recently issued by the U. S. Pulp Producers Association, U. S. consumption reached what apparently was an all-time record in 1945—11,362,633 tons. That's probably just about half of the pulp consumed by the entire world in that year.

This figure includes the official U. S. Department of Commerce figure for consumption in paper and paperboard production of 10,822,633 tons plus an estimated consumption of dissolving and other pulps in other than papermaking uses, made by the association itself.

The total was 300,000 tons above the figure for 1944 consumption, similarly arrived at. It was also about 312,000 tons above the 1942 consumption figure, as shown in data which this magazine has been publishing annually. Apparently it was a record but one of the principal reasons for this was the vastly increased use of wood pulp during 1945 for rayon smokeless powder and other non-paper uses.

Early in 1945, use of wood pulp for smokeless powder in the U. S. reached a consumption rate of 60,000 tons per quarter and this diversion of wood pulp did not cease until late in the year. Wood pulp for rayon reached a new high of nearly 300,000 tons in 1945 in the U. S. and was still climbing. Cellophane use reached 60,000 and will probably reach 90,000 soon, while the use for plastics, fillers, molding powders and may have been about 100,000 tons.

U. S.-Canadian Production

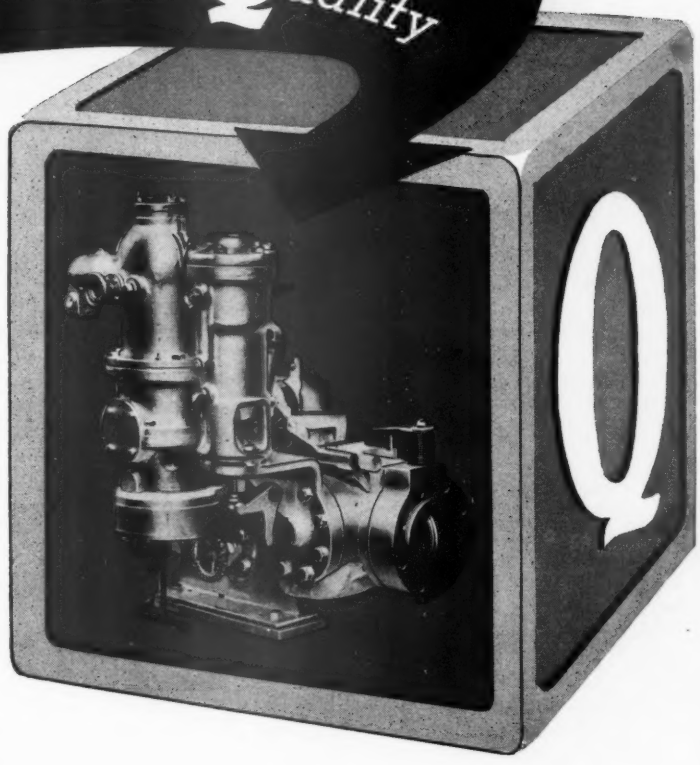
The United States and Canada produces the greater part of the world's pulp. Their combined production reached 15,596,000 tons in 1945, more than 300,000 tons over their combined output of 15,262,000 tons in 1944 but below their record year, 1942, when they made 16,255,000 tons and also below 1941, when their output was 16,101,000 tons. Back in the 1930's, the U. S. and Canada were only making, together, from 7 to 10 million tons annually.

In these last two years, the entire world probably produced less than 23-25 million tons, so the North American pulpmaking countries manufactured about two-thirds of the world production.

U. S. production of 10,164,000 tons was only 56,000 tons above 1944 but below 1942's all time record of 10,783,000 tons and 1941's 10,375,000 tons. The only time the American mills have lapsed below 10 million in the past five years was in 1943 and that was the year when Washington officials and the army were, belatedly, finding out how important pulp was to the war. If it hadn't been for labor losses and other irretrievable set-backs in that mid-war period, before the government realized the essentiality of pulp and paper, there is no doubt pulp production would have broken even the 1941 and 1942 records in subsequent years.

It was a similar story in Canada, where pulp and newsprint manufacture is the No. 1 industry of the nation. Canada's 1945 pulp output of 5,432,000 tons, as estimated by the Daily Mill Stock Reporter, was

Here's the answer to paper output Quality



The Westinghouse *Mechanical-Oil Relay Governor* holds steam turbine drive speeds constant under varying loads

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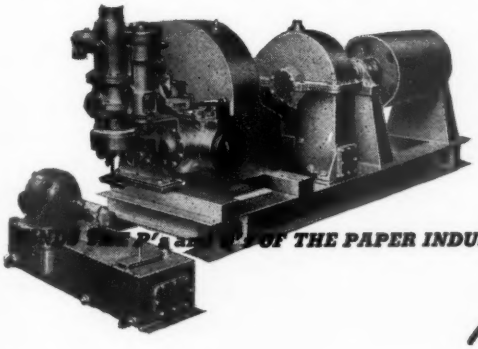

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Paper Machine Drives

about 280,000 tons above 1944's official figure of 5,154,000 tons but below 1941 and 1942 slightly. Canada, in the war earlier, also had its record pulp year one year ahead of the U. S. Top year for pulp production in the Dominion is still 1941 when 5,720,000 tons were produced.

Paper mills in early part of 1946 were using pulp on a heavy scale, operating on production schedules above anything that had been recorded in a long time.

Beginning last August with the first shipments since 1939, the Swedish pulp companies had sent 858,000 tons of pulp to U. S. mills up to March 1, and a small amount of Finnish pulp had likewise arrived. The Department of Commerce estimate announced another 200,000 tons might arrive by July 1.

Here are highlights of a Department of Commerce analysis of the pulp situation for 1946:

"The extent to which domestic paper manufacturers can meet the anticipated heavy demand for paper in 1946 depends to a substantial degree upon the amount of wood pulp which foreign producers can supply to American consumers. In pre-war years the United States was dependent upon imports for more than

U. S. WOOD PULP PRODUCTION BY REGIONS — 1945

All Grades except defibrated, exploded and asplund fibre.
(Tons of 2,000 pounds)

	New Eng.	Mid. Atl.	Lake	Pacific	South	Total
Sulphite	*512,002*	*263,334*	*607,247*	*877,837*	*97,399*	*2,357,819*
Bleached	336,624	157,490	403,030	544,543	97,399	1,539,086
Unbleached	175,378	105,844	204,217	333,294	0	818,733
Sulphate	*40,582**	*118,191**	*240,126**	*426,174*	*3,652,263*	*4,477,282*
Bleached	0	118,191*	*	64,280	655,788	838,259
Unbleached	40,528*	*	240,126	361,894	2,996,475	3,639,023
Soda	127,872	148,733	50,195*	*	116,436	443,236
Semichemical	0	*	27,129*	*	297,447	324,576
Screenings & Off Quality	25,222	8,193	20,208	24,411	116,490	194,524
Groundwood	601,217	251,700	404,208	263,367	176,959	1,697,451
Total	1,306,841	790,151	1,349,113	1,591,789	4,456,994	9,494,888

*Data combined with that of another region to avoid disclosing one company's data.
Source: As reported to the U. S. Pulp Producers Association, and estimated for 1% of total production.

UNITED STATES WOOD PULP PRODUCTION BY REGIONS — 1944

(Tons of 2,000 Pounds)

Region	Total All Grades	Total Sulphite	Bleached Sulphite	Unbleached Sulphite	Total Sulphate	Bleached Sulphate	Unbleached Sulphate	Ground-wood	Soda	Semi-Chemical
West Coast	1,644,531	907,800	558,067	349,733	422,519	55,817	366,702	259,922	**	54,290
New England	1,249,792	505,584	318,282	187,302	40,733**	0	40,773**	562,448	117,508	23,479
Middle Atlantic	672,895	273,673	165,861	107,812	*	*	**	244,585	146,609	8,028
Lake States	1,429,410	601,028	379,937	221,091	362,131*	117,865*	244,266	402,188	43,019***	21,044
South	4,390,638	100,017	100,017	0	3,700,400	619,292	3,081,108	88,538	119,061	38,622
Totals	9,387,266	2,388,102	1,522,164	865,938	4,525,823	792,974	3,732,849	1,557,681	426,197	489,463

*Middle Atlantic Bleached Sulphate included in Lake to avoid disclosing one company's production.
**Middle Atlantic Unbleached Sulphate included in New England to avoid disclosing one company's production.
***Pacific Soda Pulp included in Lake to avoid disclosing one company's production.
Source: United States Pulp Producers Association.

UNITED STATES WOOD PULP PRODUCTION BY REGIONS — 1943

(Tons of 2,000 Pounds)

Region	Total All Grades	Total Sulphite	Bleached Sulphite	Unbleached Sulphite	Total Sulphate	Bleached Sulphate	Unbleached Sulphate	Ground-wood	Soda	Semi-Chemical
West Coast	1,521,531	895,938	550,078	345,860	333,140	27,568	305,572	245,663	**	37,790
New Englannd	1,308,904	545,706	356,655	189,051	38,685	0	38,685	593,902	125,317	5,294
Middle Atlantic	731,757	281,251	158,717	122,534	46,849*	46,849	*	256,760	144,079	2,818
Lake States	1,317,226	603,763	375,957	227,806	288,923	53,566	235,357	381,255	40,785	2,500
South	4,190,739	116,322	116,322	0	3,539,831	618,252	2,921,579	225,282	109,005	200,299
Totals	9,070,157	2,442,980	1,557,729	885,251	4,247,428	746,235	3,501,193	1,711,862	419,186	248,701

*Unbleached included in New England's total to avoid disclosing one company's data.
**Soda included in Lake States' total to avoid disclosing one company's data.
Source: United States Pulp Producers Association.

PACIFIC COAST PULP PRODUCTION — 1931-1945

Pacific Coast States and British Columbia
(Tons of 2,000 lbs.)

	1931 Tons	1932 Tons	1933 Tons	1934 Tons	1935 Tons	1936 Tons	1937 Tons
Washington	580,016	420,529	583,770	709,380	775,722	895,797	1,184,390
Oregon and California	237,532	187,133	189,332	240,167	262,221	302,634	338,802
British Columbia	310,029	259,586	343,897	383,818	377,522	416,433	425,558
Total Pacific Coast	**1,127,577**	**867,248**	**1,117,999**	**1,333,365**	**1,415,465**	**1,614,864**	**1,948,750**

	1938 Tons	1939 Tons	1940 Tons	1941‡ Tons	1942* Tons	1943* Tons	1944* Tons	1945 Tons
Washington	836,959	1,107,318	1,443,121	1,475,671	1,572,841	1,153,177	1,256,374	1,265,436
Oregon and California	250,788	270,829	396,142	518,479	421,154	403,306	412,342	372,939
British Columbia	242,020	321,132	445,564	494,811	448,272	385,875	465,787	463,150
Total Pacific Coast	**1,329,767**	**1,699,279**	**2,284,827**	**2,488,861**	**2,442,267**	**1,942,358**	**2,134,503**	**2,101,525**

Source—U. S. figures up to 1940 and in 1945, from U. S. Dept. of Commerce, Bureau of Census; B. C. figures from Dept. of Lands, Forest Branch; and Dominion Bureau of Statistics.

‡ Figures based upon United States Pulp Producers Association total for Oregon and Washington. Division of production between Oregon and Washington estimated by Pacific Pulp & Paper Industry. No wood pulp production in California.

*U. S. figures from War Production Board.

REGIONAL PERCENTAGES OF UNITED STATES WOOD PULP PRODUCTION

Total and by Grades in 1943, 1944 and 1945

Region	Sulphite			Sulphate			Groundwood			Soda			Total		
	1943	1944	1945	1943	1944	1945	1943	1944	1945	1943	1944	1945	1943	1944	1945
New England	22	21	22	1	*	1*	35	36	35	30	28	29	14.5	13	14
Middle Atlantic	11.5	12	11	1	2*	2.5*	15	16	15	34	34	34	8	8	8
Lake States	25	25	26	7	7	5*	22	26	24	10	10**	11*	14.5	14.5	14
South	5	4	4	83	82	82	13	5	10	26	28	26	46	47	47
West Coast	36.5	38	37	8	9	9.5	15	17	16	**	**	*	17	17.5	17
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Data combined with that of another region to avoid disclosing one company's data.
Source: United States Pulp Producers Assn.

U. S. PACIFIC COAST WOOD PULP PRODUCTION, 1923-1945

Tons of 2,000 lbs.

1923	299,596	1931	817,548	1939	1,384,147
1924	309,433	1932	607,662	1940	1,839,263
1925	322,594	1933	773,102	1941	1,994,150
1926	378,005	1934	935,033	1942	1,968,658
1927	449,218	1935	1,011,421	1943	1,521,531
1928	562,514	1936	1,198,431	1944	1,644,531
1929	780,494	1937	1,523,192	1945	1,591,789
1930	815,089	1938	1,087,747		

—Source, U. S. Pulp Producers Assn.

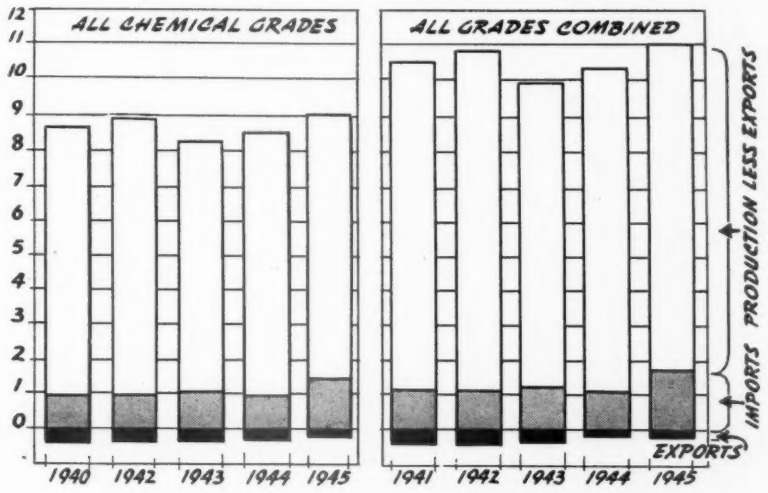
a quarter of its total wood pulp supply. Consumers who were entirely dependent upon purchased supplies needed imports up to about 70% of their requirements. No fundamental change took place during the war which alters this general condition of supply for nonintegrated paper mills.

"Recent reports from Sweden indicate that despite lack of coal and some other materials, a production rate of around 65% can be expected in 1946. If this level can be maintained, Sweden would have available for export in 1946 about 1,700,000 short tons of wood pulp, including stocks carried over. The United States could expect to receive a substantial part of this amount, perhaps as much as half.

The report estimated Swedish shipments of 400,000 tons to the U. S. for the first half of 1946 and 600,000 tons for the last half, augmented

U. S. PULP PRODUCTION, EXPORTS AND IMPORTS

(Showing all chemical grades and total of all grades combined in millions of tons).



STOCKS OF WOOD PULP OF OWN PRODUCTION

Held by United States Wood Pulp Producers

(In Tons of 2,000 Lbs.—Does not include purchased pulp)

	January 1, 1945		December 31, 1945	
	For Own Use	For Market	For Own Use	For Market
Total All Grades*	55,850	10,997	55,603	15,592
Total Sulphite	12,389	8,141	13,046	13,520
Bleached Sulphite	5,071	7,290	5,669	11,436
Unbleached Sulphite	7,318	851	7,377	2,084
Total Bleached Sulphate	4,136	26	3,873	126
Total Unbleached Sulphate	9,706	939	8,767	127
Total Soda	1,874	464	1,741	192
Semi-Chemical	72	0	137	0
Groundwood	25,438	142	26,202	279
Screenings and Off Quality	2,235	1,285	1,837	1,348

Source: As reported to the United States Pulp Producers Association.
*Exclusive of defibrated and exploded wood pulp and asplund fiber.

by Finnish and Norwegian shipments of 50,000 tons in the first half and 150,000 in the last half. It continued:

"Canadian producers of wood pulp responded to the urgent needs of the U. S. and shipped during the war years substantially in excess of their prewar yearly averages of 605,000 tons. In 1943 the U. S. received 1,280,000 tons from Canada; in 1944, 1,070,000 tons; and in 1945, 1,100,000 tons. Although considerable Canadian wood pulp is likely to be diverted from the export market in 1946 for domestic paper manufacture (chiefly for export) the increased productive facilities scheduled for start-up during the year indicate that Canada could supply some 1,200,000 tons to United States consumers in 1946. It is probable that not more than 500,000 tons can be expected during the first half of the year.

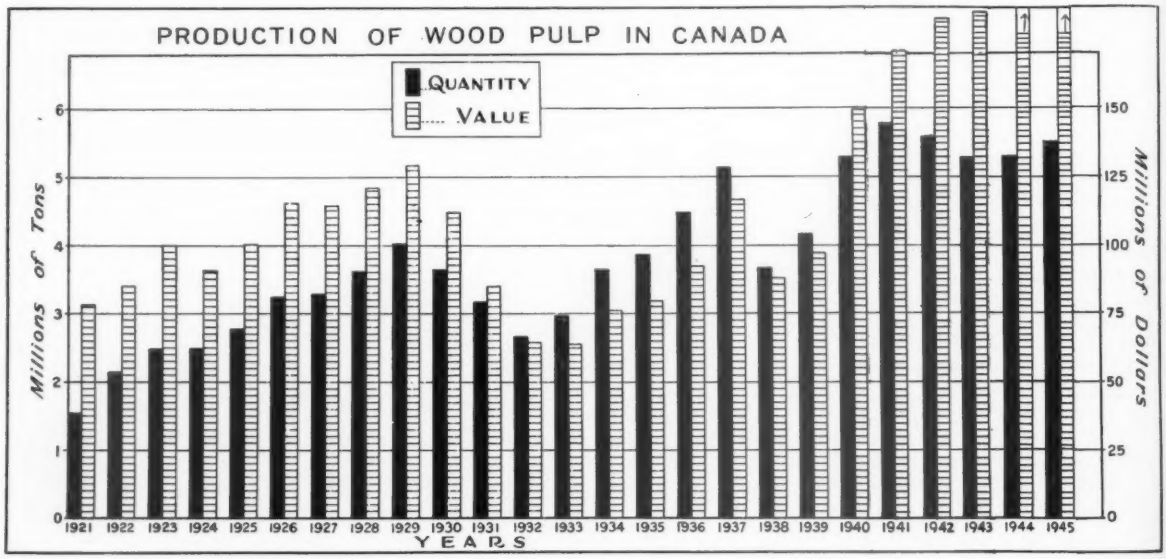
On the basis of these approximations, assuming that there will be no abnormal interruption in the flow of Swedish wood pulp, it appears that the U. S. could expect about 2,400,000 short tons of foreign pulp in 1946, of which about 950,000 tons would be received in the first half of the year.

"The census reports show U. S. shipments (production) of market pulp in October and November 1945 to total about 245,000 tons, which adjusted on a working-day basis results in an annual production of approximately 1,400,000 tons. However, during these 2 months, individual mill reports indicate that several integrated mills were still shipping market pulp which will be discontinued in 1946 in the light of announced plans for expansion. Adjusting for this and for a reasonable allowance for interruptions in operation brings estimated 1946 market pulp production to 1,250,000 tons.

"Of total estimated U. S. market pulp production for 1946 allowance is made for exports of 150,000 tons.

"Again using the census reports for October and November, shipments of nonpaper pulp adjusted to an annual basis would amount to 320,000 tons. This figure is raised to 350,000 tons for the year to allow for one mill which did not op-

This chart showing wood pulp production and values in Canada would be inadequate to show values for the last couple of years, even if we had the actual figures. They would go substantially over the top of the chart.
Production in 1944 was 5,153,651 tons, according to official report, and in 1945 it was 5,432,000 tons, according to estimate of the Daily Mill Stock Reporter.
Other figures for recent years (official): 1941—Production, 5,720,847 tons, valued at $175,439,551; 1942—5,606,461 tons; $192,145,062; 1943—5,272,830 tons, $194,434,202.



CANADIAN PULP PRODUCTION

(Tons of 2,000 lbs.)

	Mechanical Tons	Sulphite Tons	Sulphate[1] Tons	Total Tons
1920	1,090,114	654,273	188,487	1,922,774
1921	931,560	476,929	131,337	1,539,826
1922	1,241,185	678,878	217,862	2,137,925
1923	1,449,106	749,668	224,812	2,413,586
1924	1,427,782	768,035	218,207	2,414,024
1925	1,621,917	842,785	242,207	2,706,909
1926	1,901,268	995,203	256,074	3,152,545
1927	1,922,124	1,016,060	262,512	3,200,696
1928	2,127,699	1,117,227	256,969	3,501,895
1929	2,420,774	1,236,232	250,104	3,907,110
1930	2,283,130	1,076,804	188,253	3,548,187
1931	2,016,480	941,586	145,156	3,103,222
1932	1,696,021	941,579	144,367	2,781,967
1933	1,859,049	937,313	182,988	2,979,350
1934	2,340,441	1,020,493	205,980	3,566,914
1935	2,458,000	1,025.000	206,000	3,689,000
1936	2,910,338	1,168,927	273,494	4,352,759
1937	3,308,517	1,373,232	312,741	4,994,490
1938	2,650,000	925,000	258,000	3,833,000
1939	2,738,011	1,028,820	313,628	4,080,459
1940	3,305,484	1,480,545	399,267	5,290,762
1941	3,494,922	1,664,516	426,743	5,720,847
1942	3,260,097	1,753,453	459,254	5,472,804
1943	2,998,913	1,712,571	441,421	5,152,905
1944	3,076,296	1,609,629	467,726	5,153,651
1945*	3,320,000	1,637,000	475,000	5,432,000

[1]Prior to 1939 the sulphate totals included sulphate pulps only. 1939, 1940 and 1941 sulphate totals include soda and other pulp, according to the Dominion Bureau of Statistics.
*Estimated. For all other years figures are official. 1945 estimates from "Mill Stock Reporter."

STRENGTH · COLOR · SERVICE · DEPENDABILITY OF SUPPLY

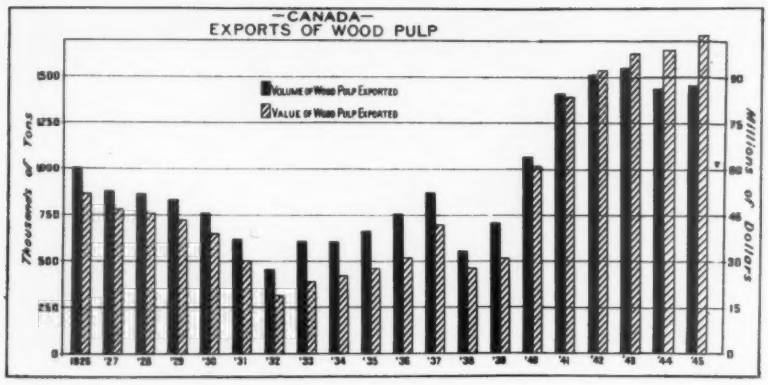
Strong pulp makes strong paper. The fibre characteristics of British Columbia hemlock from which our Powell River Unbleached Sulphite Pulp is manufactured assures pulp of superior strength. For strength and for color . . . for service . . . for dependability of supply—buy Powell River Unbleached Sulphite Pulp.

Superior Strength

POWELL RIVER

Unbleached Sulphite Pulp

POWELL RIVER SALES COMPANY LIMITED . . . VANCOUVER . . . B. C.


—CANADA—
EXPORTS OF WOOD PULP
Volume of Wood Pulp Exported
Value of Wood Pulp Exported
Thousands of Tons
Millions of Dollars
1926 '27 '28 '29 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40 '41 '42 '43 '44 '45

erate in 1945 and for some increase in output in other mills. After allowing for exports and production of nonpaper pulp, a balance is left of about 750,000 tons of domestic pulp for paper and board manufacture.

"Total wood pulp imports from Canada in 1946 are expected to approximate 1,200,000 tons, the average of the past three years plus an allowance for some additional capacity scheduled to come into production during the year. Census reports for October and November 1945 show consumption by paper and board mills of own manufacture (integrated) imported pulp (from Canada) at an annual rate of about 360,000 tons. Additional Canadian production integrated with paper production in the U. S. expected during the year brings this estimate to around 500,000 tons. This, subtracted from the total of 1,200,000 tons leaves a balance of 700,000 tons of market pulp (both paper and nonpaper grades) from Canada.

"U. S. imports of dissolving (nonpaper) pulp from Canada in the last five years has ranged from around 130,000 tons per year. It is expected that in 1946 Canada can ship about 200,000 tons of nonpaper pulp to the United States, mostly of dissolving grades. Thus, after subtracting integrated pulp and nonpaper pulp from an estimated total of 1,200,000 tons leaves a balance of 500,000 tons of market pulp for paper and paperboard mills."

Imports from Europe were previously estimated at 1,200,000 tons. The estimate of U. S. consumption needs for market pulp was based on census reports which show a consumption of purchased (market) pulp, by paper and board mills only, for Oct.-Nov. 1945 at 424,000 tons. Adjusting this to an annual basis brings the amount to around 2,400,000 tons. This was 2,600,000 tons in view of demand for heavier weight papers.

The figure of 550,000 tons of nonpaper pulp for 1946 consumption needs was arrived at by reference

SOURCES OF U. S. WOOD PULP IMPORTS IN PERCENTAGES

Year	From Sweden	From Canada	Other
1939	43%	31%	26%
1940	23%	68%	9%
1941-44		100%	nil
1945	38%	62%	nil

Source: Department of Commerce.

U. S. IMPORTS OF CANADIAN PULP DURING 1945

(Percentage of total imports—the complement of these percentages represent percentage of imports from Sweden*)

Grade	First 6 Mos.**	First 9 Mos.	Entire Year
Unbl. sulfite	100%	75%	56%
Bleached sulfite	100%	91%	79%
Unbl. sulfate	100%	47%	27%
All grades	100%	79%	62%

*Except for very small amount from Finland in last quarter.

**In first six months of 1945 Canada shipped 519,415 tons to the U. S., about 50% of total amount shipped from there to U. S. during year.

Source—Dept. of Commerce.

PROPORTION OF UNITED STATES MARKET FOR PULP SUPPLIED BY AMERICAN PULP MILLS AND FOREIGN PULP MILLS—1939-1943-1944-1945

Tons—2,000 Lbs.

TOTALS By Grades.	Pulp Produced By U. S. Mills for Sale in Domestic Market — 1939	Pulp Imported Into United States — 1939	Pulp Produced By U. S. Mills for Sale in Domestic Market — 1943	Pulp Imported Into United States — 1943	Pulp Produced By U. S. Mills for Sale in Domestic Market — 1944	Pulp Imported Into United States — 1944	Pulp Produced By U. S. Mills for Sale in Domestic Market — 1945	Pulp Imported Into United States — 1945
	1939		1943		1944		1945	
Total—All Grades	1,049,753	2,035,249	1,313,067	1,252,292	1,500,000	1,072,000	1,455,667	1,754,065
Total—Sulphite	685,774	1,135,302	904,651	842,005	946,635	712,000	945,150	1,045,753
Bleached Sulphite	464,296	474,109	710,340	361,708	752,713	321,000	738,461	388,456
Rayon, Special Chemical	106,760	88,052	.....	.....	420,921	135,000	346,541	146,032
Other	319,687	386,057	.....	.....	331,792	186,000	391,920	242,424
Unbleached Sulphite	219,012	661,193	194,311	480,297	193,922	391,000	206,689	657,297
Total—Sulphate	143,614	654,419	264,415	153,139	378,223	146,000	344,064	452,428
Bleached Sulphate	77,786	108,252	53,296	62,000	99,637	59,000	113,485	91,996
Unbleached Sulphate	65,793	546,167	211,119	91,139	278,586	87,000	230,579	360,432
Total Groundwood	30,194	227,432	48,859	213,370	50,015	168,000	52,779	222,710
Total Soda	86,591	8,952	87,944	19,892	96,843	16,000	83,398	21,157
Total Semi-Chemical	.....	.....	35	.....	701	0	.....	.....
Total—Miscellaneous, Damaged and Off-Quality	16,189	192	7,163	23,886	27,958	30,000	30,276	12,017

"Pulp Produced by U. S. Mills for Sale in Domestic Market" includes that part of the stocks on hand at the end of the year intended for future shipment to domestic buyers.

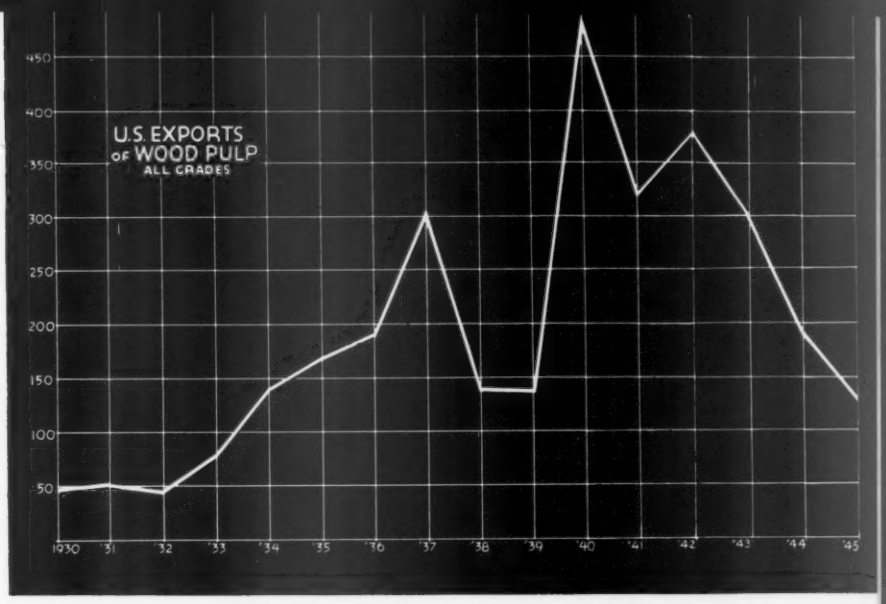
Source: United States Pulp Producers Association. Figures exclusive of defibrated and exploded wood pulp and asplund fiber.

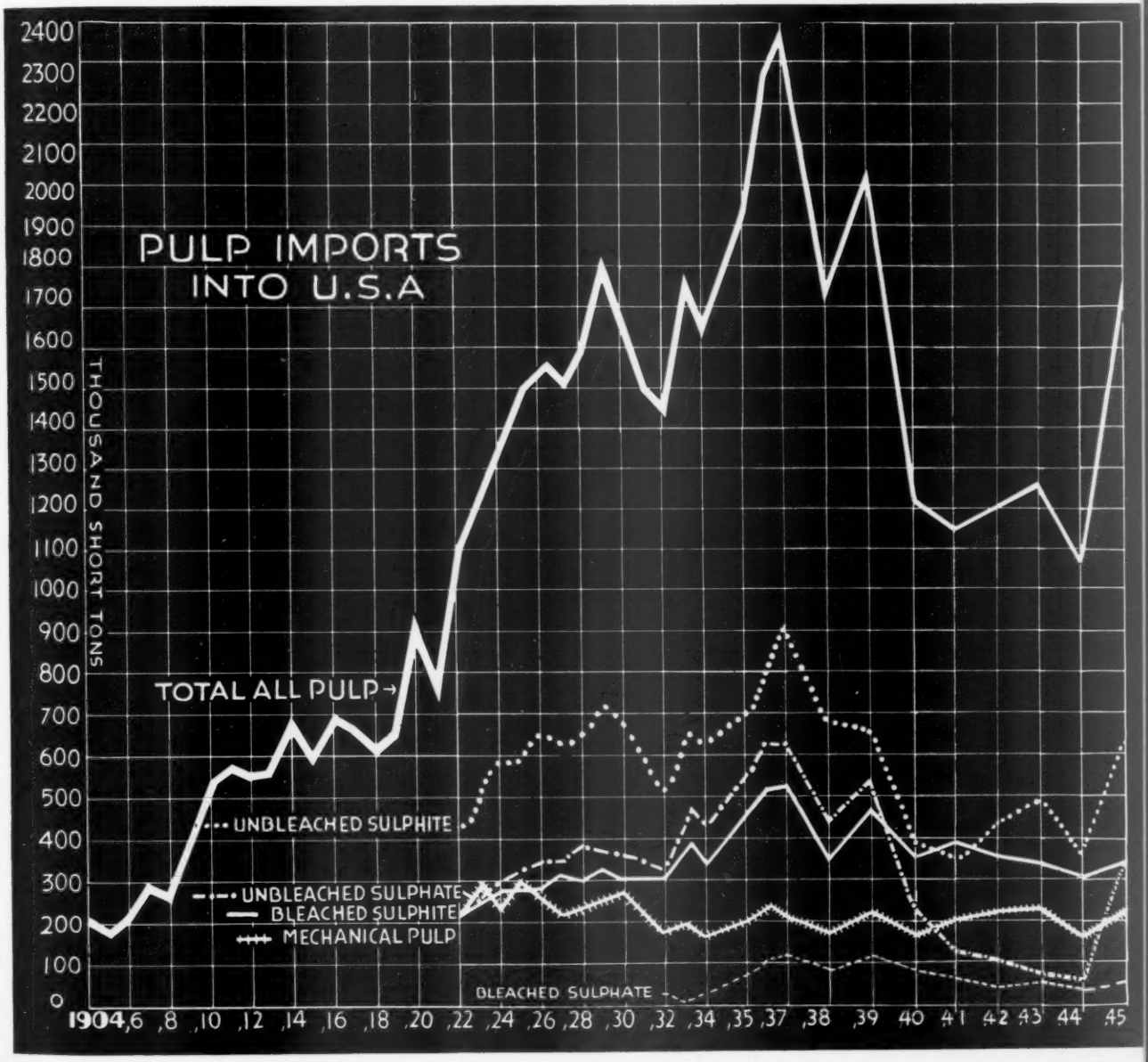
U. S. WOOD PULP EXPORTS

Quantity and Value

	Short Tons	Value
1945	*140,000	----
1944	*184,000	----
1943	*263,000	----
1942	*380,000	----
1941	*322,000	----
1941 (9 mos.)	246,986	$15,801,270
1940	480,362	29,649,300
1939	139,504	6,493,140
1938	140,484	9,986,826
1937	302,050	19,891,483
1936	193,485	10,600,176
1935	171,710	8,632,971
1934	142,931	7,005,559
1933	79,191	3,113,883
1932	47,860	2,037,553
1931	53,307	2,405,642
1930	48,426	2,070,553

*Estimated by U. S. Pulp Producers Assn.
Source for all other figures: U. S. Dept. of Commerce.





SWEDISH PULP STOCKS

As the season opens in May of this year for shipments, Swedish pulp inventories were expected to approximate:

	Tons
Bleached sulfite	60,500
Unbleached sulfite	157,000
Bleached sulfate	10,700
Unbleached sulfate	143,000

U. S. SWEDISH PULP IMPORTS

(V-E Day through Mar. 14, 1946, when shipping virtually ceased until after end of Baltic port freeze-up—First postwar shipment was June 25, 1945)

	Short Tons	*Value Dollars*
Unbleached groundwood	32,745	$1,227,394
Bleached groundwood	1,177	43,098
Unbleached sulfite	345,698	21,373,581
Bleached sulfite, rayon and special grades	4,140	354,546
Other bleached sulfite	63,142	4,692,593
Unbleached sulfate	378,471	22,972,480
Bleached sulfate	30,876	2,240,955
All soda pulp	39	2,119
Unclassified	1,338	77,992
Total (in 9 months of shipping)	857,626	$52,984,758

Source: U. S. Census Bureau.

to War Production Board data and major consumers.

As stated previously, these estimates of supply and consumption of market pulp indicate nonintegrated paper and paperboard mills will have nearly enough pulp to operate at full capacity over the year as a whole provided. "There is a possibility, however, that some mills which have not been able to obtain their proportionate share of the wood pulp available in 1945, may run short of supplies in the second quarter of the year. Such a condition would be relieved when European shipments are resumed in June," said the report.

Rise of Kraft Pulps

Most sweeping and significant increases of the pulp industry have been in the kraft field in recent years.

This has been to a large extent confined to the South of the United States with the growth of a great industry from Virginia to East Texas. Nearly one-half of the pulp in the United States is produced in that region by the sulfate process. But in the past year, particularly, and in immediate future years, expansion in the sulfate field will also take place in the Northeast, in Ontario and on the Pacific Coast.

Southern mills are making bond paper from sulfate and it is probably going to be used in creped wadding in the North. There seems no limit to the improved papers that can be made by this process. It has, likewise, opened the field to utilization of new tree species for pulping—the birch, beech, etc., in the Northeast in place of the depleted supply of spruce, and of young fast growing Douglas fir in the west in place of the traditional hemlock.

SWEDEN'S PULP EXPORTS

(In short tons)

	—To All Countries— 1945	1944	To U. S. 1945	% to U. S. 1945
Mechanical, wet	260,118	1,067	27,933	8%
Mechanical, dry	53,936	9,523		
Sulfite pulp, bleached	262,146	156,340	56,496	21%
Sulfite pulp unbleached, wet	43,987	2,720	283,959	48%
Sulfite pulp unbleached, dry	527,090	47,067		
Sulfate pulp bleached	43,273	13,088	28,070	65%
Sulfate pulp unbleached, wet	31,078	10,346	274,429	51%
Sulfate pulp unbleached, dry	505,066	60,543		

Source: Total exports from Svensk Pappers Tidning; U. S. shipments (none arrived until June 25, 1945) from U. S. Dept. of Commerce (to Jan. 3, 1946).

SWEDISH WOOD PULP IMPORTS BY U. S. (1931-39)

(Source: Foreign Commerce and Navigation of the U. S.—Monthly and Annual)

	Average 1931-1935		Average 1936-1939		Average 1931-1939	
By Months	**Tons**	**Index**	**Tons**	**Index**	**Tons**	**Index**
January	106,472	163.00	98,052	123.03	102,729	143.26
February	68,227	104.45	74,594	93.60	71,057	99.09
March	30,083	46.06	44,043	55.27	36,287	50.60
April	13,643	20.89	16,662	20.91	14,984	20.90
May	38,030	58.22	70,081	87.94	52,275	72.90
June	59,668	91.35	100,151	125.67	77,660	108.30
July	64,081	98.11	87,203	109.42	74,358	103.69
August	68,155	104.34	92,487	116.05	78,969	110.13
September	69,306	106.10	84,643	106.21	76,123	106.16
October	82,026	125.58	86,638	108.71	84,076	117.25
November	93,563	143.24	104,802	131.51	98,558	137.44
December	90,572	138.66	96,975	121.68	93,418	130.28
Year	783,826	100.	956,331	100.	860,494	100.
By Quarters						
First	204,782	104.50	216,689	90.64	210,073	97.65
Second	111,341	56.82	186,894	78.17	144,919	67.37
Third	201,542	102.85	264,333	110.56	229,450	106.66
Fourth	266,161	135.83	288,415	120.63	276,052	128.32
Year	783,826	100.	956,331	100.	860,494	100.

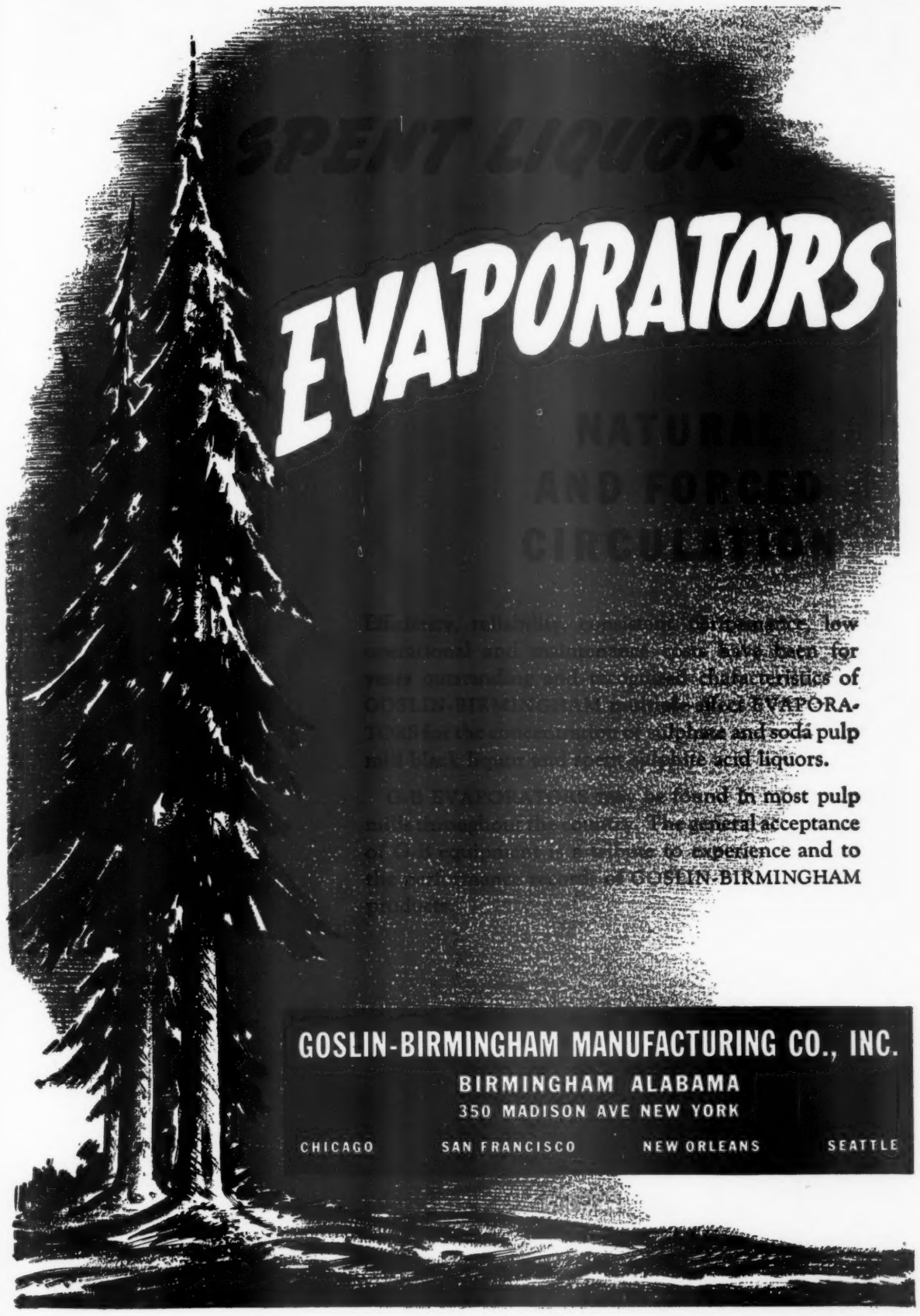
FINLAND'S EXPORTS OF CHEMICAL PULP

(In short tons, dry weight)

	—1945— Sulfite tons	Sulfate tons	—1944— Sulfite tons	Sulfate tons
Soviet Union	106,050	67,365	6,735	7,986
Britain	39,358	19,531	.....	.....
U. S. A.	4,980	5,891	.....	.....
France	.....	.....	3,423	1,872
Holland	.....	.....	1,070	774
Germany	.....	.....	62,468	40,699
Denmark	7,320	9,749	18,624	13,613
South America	753	.....	.....	.....
Other	1,239	1,922	7,752	3,891
	159,700	104,458	100,072	68,835

Source: Finnish Paper & Timber Journal.

Consumption of sulfate pulp in the U. S. continued to rise in 1945 to 4,675,711 tons, nearly 100,000 over the previous year, but this was due to stepped up imports. Production actually slipped a little, according to the table published by U. S. Pulp Producers, showing production of about 4,470,000 tons in 1945, about 80,000 tons below 1944. This was a temporary regression, no doubt, as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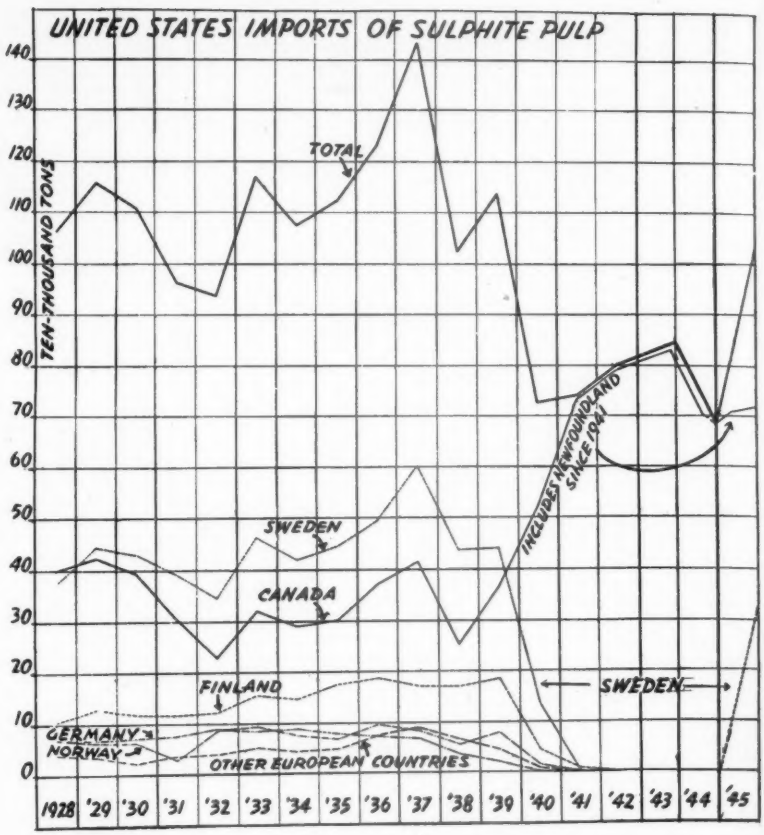
there were many plans afoot for further increases when labor is available and construction can be accomplished.

Production of U. S. sulfate pulp has in just six years surged upward 1½ million tons. Sulfite pulps rose from about 2,000,000 tons in 1939 to 3,000,000 tons in 1942 but since declined to 2,358,500 tons in 1945. However, new cooking and recovery process and savings effected in wood preparation, as well as the growing demand for special papers and non-paper uses are undoubtedly going to keep sulfite pulp very much in the picture in the future.

Defibrated, exploded and semi-chemical pulps have shown tremendous gain in the war years and increasing demands for paperboard and building board is likely to bring further increases in this type of pulp.

In regard to kraft pulp, it may be recalled that Martin Williams, of the University of Alabama, predicted in the past year that annual U. S. kraft pulp capacity would reach 7,000,000 tons by 1950. It was increased from 5,161,694 tons to 5,298,790 tons in 1945. In 1919, the percentage of American pulp made by sulfate process was only 3.4% but today it is about half the total.



UNITED STATES WOOD PULP IMPORTS

Quantity and Value

1922 - 1945

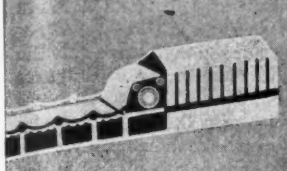
	Chemical Pulp		Mechanical Pulp		Total Pulp	
	Short Tons	Value	Short Tons	Value	Short Tons	Value
1945	1,324,000	.....	222,000	.....	1,752,000	.....
1944	895,000	.....	177,000	.....	1,072,000	.....
1943	1,070,000	.....	236,000	.....	1,306,000	.....
1942	1,017,000	.....	220,000	.....	1,237,000	.....
1941	1,060,000	.....	198,000	.....	1,158,000	.....
1940	1,054,000	$55,481,017	171,000	.....	1,225,000	$60,193,666
1939	1,798,000	70,659,074	228,000	.....	2,026,000	75,877,826
1938	1,551,917	69,181,811	170,470	$3,592,369	1,722,387	72,774,180
1937	2,176,343	93,955,854	218,422	4,342,168	2,394,765	98,298,022
1936	2,050,051	78,839,776	227,778	4,051,224	2,277,829	82,891,000
1935	1,743,602	67,483,566	190,041	3,277,385	1,933,643	70,760,951
1934	1,616,754	58,605,219	189,374	3,245,050	1,806,128	61,850,269
1933	1,731,513	54,184,001	210,280	3,214,919	1,941,793	57,398,920
1932	1,293,495	43,652,916	188,464	3,268,457	1,481,959	46,921,373
1931	1,386,112	56,409,638	210,656	4,498,022	1,596,768	60,907,660
1930	1,533,646	74,140,504	299,256	7,146,290	1,832,902	81,286,794
1929	1,614,043	82,840,220	273,461	6,245,776	1,887,504	89,085,996
1928	1,513,125	78,476,280	249,198	5,443,496	1,762,323	83,919,776
1927	1,433,919	80,124,449	245,599	5,961,821	1,679,518	86,086,270
1926	1,431,973	83,208,851	303,758	8,278,220	1,735,731	91,487,071
1925	1,334,900	73,469,063	331,092	8,517,116	1,665,992	81,986,179
1924	1,279,177	68,678,210	245,919	7,190,129	1,525,096	75,868,339
1923	1,084,013	65,495,800	299,630	9,280,863	1,383,643	74,776,663
1922	1,043,832	57,600,844	215,810	5,706,529	1,259,642	63,307,373

Source: Bureau of the Census.

Detail may not add because screenings are not listed separately, but are included in totals.

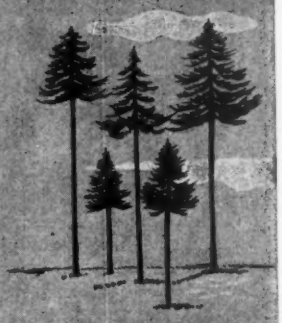
two decades of pioneering

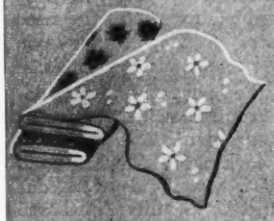
A Continuous Record of Product Development



Since 1926, when it pioneered bleached sulphite paper pulp from Western Hemlock, Rayonier has been making scientific history in the interest of its customers.

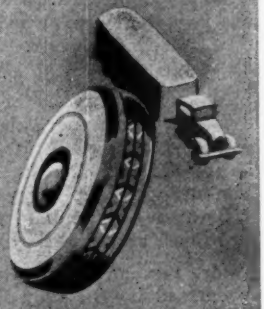
Through research, the company perfected a rayon pulp from a brand new source of supply — Southern Pine. This opened up a new agricultural and industrial economy in the South.

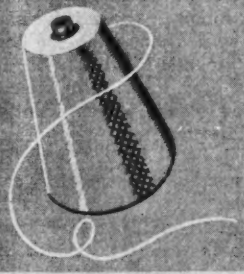




In 1930, the company introduced the first pulp from Western Hemlock for the viscose rayon industry. A dissolving pulp for use in making cellophane followed.

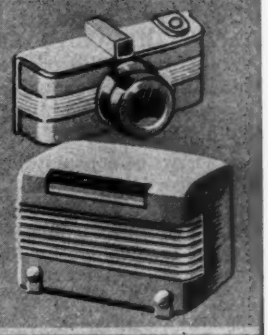
Another Rayonier pulp enabled the manufacture of high tenacity yarns for tire cord, contributing to one of the most outstanding advances made by the rayon industry.





Upsetting precedent, the next product was a pulp for the acetate rayon industry. A cellulose for nitrating purposes also was developed.

Special pulps have been developed also for making photographic papers, certain plastics and other cellulose-base products.



Pioneering requires initiative, vision, confidence and courage — a continuing search for new products and new uses. This is an underlying feature of Rayonier's customer program.

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Mills: Hoquiam, Port Angeles and Shelton, Wash., and Fernandina, Fla.

More is produced than ever before—but still short of needs. Immediate outlook critical but long term picture has bright spots.

In this chapter, both the short term and the long term picture of the wood situation are dealt with.

As for the short term view, men close to the wood situation are speaking in frank terms. "A hell of a fix" is the most concise opinion rendered. Pulpwood is even more "critical" than it was during the war.

Reasons for this are higher costs, loss of war prisoner labor, failure of former woods labor to return to the woods and the fact that the "win-the-war" appeals can no longer be made to stimulate production by farmers and others.

More mechanization in the woods appears to be the only factor that can really improve the situation.

Yet, more pulpwood was produced in the United States than ever before in the past two years. This still wasn't enough with consumption running at about twice the rate of the early 1930's.

Even with consumption at 16,911,000 cords in the United States in 1945—about 150,000 cords over 1944 and higher than any previous year in war or peace except 1942 (17,275,000 cords) — wood supply was far short of needs or demand. This 1945 consumption figure was 53% over 1939.

Mill receipts of domestically produced pulpwood in the U. S. in 1945 totaled 15,315,000 cords, according to the government agencies, which was just 34,000 cords below 1944's record and higher than any other year. Receipts were 10% above 1941.

Results by Regions

Government figures shows pulpwood consumption in Northeast U. S. made a phenomenal spurt of 1¼ million cords over 1944 and 1943 and a million over 1941 and 1942 to hit a new high of 3,244,545 cords.

The South pushed wood consumption to a new record for that region, too, getting out 7,207,649 cords, about a half million over the previous year. The Appalachian region maintained its high level of the previous year and in the Lake States a new high was reached, about 400,000 cords more than 1944. These two regions consumed about 4 million cords together.

The Pacific Coast consumption slid off to 2,471,530 cords (about 500 bd. ft. per cord), which was down 90,000 from 1944 and down 380,000 from its record year in 1941.

Imports of only 1,699,000 cords from Canada, just slightly over 1944, were still running at only about 75% of 1941 and 1942 figures. The embargo and restrictions on Canadian exports put into effect in both east and west Canada, when the U. S. entered the war, forced an awakening in the bureaus of Washington to the disaster brought about by failure to freeze American woods labor in time.

It's well known how Washington woke up, finally, to the emergency and summoned industry leaders such as Harold Boeschenstein, Jim Madden, Rex Hovey and later, Curtis Hutchins, to duty and they toured the country in the cause, as government emphasis belatedly shifted from restriction to more production.

As for the immediate future, one trained observer told PULP & PAPER INDUSTRY:

"The consumption figures tell the story better than inventory figures —because the South consumes roughly 45% and they use virtually no inventories. Furthermore, we are going to be faced with a terrific demand. I don't see any 'let-up.'"

Far-sighted executives in the industry suspect that the tremendous new housing programs will be taking some wood that might otherwise go into pulpwood. The enormity of the housing projects is almost beyond comprehension. One can grasp only isolated pictures, like the need for a shelter of 735,000 people in New York alone.

Beneath the new non-industry demands for wood is still the gnawing manpower problem. The 6500 war prisoners working in New England and Southern woodlands were due to leave the U. S. this April and whether they would be held further was a question.

If Canada has good weather, and her own woods production is adequate, the five or six thousand Canadians who labor in the northern U. S. woods will be available. They are badly needed. Citizens of the U. S. still show a great reluctance to work in the woods. They want to use new skills learned in the armed services, or they do not want to work that hard. As fast as they can, woods managers are shaping up the answer to that one: *mechanization.* All through the East and South the trend is toward more mechanization in the woods—not merely power saws, but adequate trucks (perhaps with universal parts and engines), tractors, bulldozers — eastern and southern adaptations of equipment

U. S. CONSUMPTION OF DOMESTIC PULPWOOD
(By Regions—In Cords)

Year—	Northeast	Appalachian	Lake States	Pacific Coast	South	Total
1941	2,210,000	1,354,000	1,509,000	2,851,000	6,090,000	13,743,000
1942	2,192,000	1,428,000	1,928,000	2,612,000	6,320,000	14,480,000
1943	1,858,000	1,277,000	1,356,000	2,444,000	6,166,000	13,100,000
1944	1,915,000	1,448,000	2,123,000	2,560,000	6,744,000	14,819,000
1945	3,244,545	1,444,346	2,543,791	2,471,530	7,207,649	16,911,861

Source: U. S. Bureau of Census.

long used in the big woods of the West Coast. Mechanization in the woods is the key to more paper.

Early 1946 Trends

As to the trends in the early part of 1946, the pulpwood price increases allowed during winter months in Lake States, South and Far West were offset by increased pay for labor.

In the South the receipts of pulpwood through the first two months, at least, of 1946 were considerably below the level of the past few years. On top of lack of labor, bad weather interfered.

And in the Far West, unusually heavy snowstorms in the logging areas of the western coastal slope shut down many camps which were producing for some of the biggest market pulp mills. It was one of the worst winters the west had experienced and forced periodic shutdowns of some mills and five-day weeks for others. Logging is moving to higher areas in that region and therefore is more subject to weather interference.

Year-end inventories of pulpwood in the U. S. showed a decline of 30% from 3,700,000 cords in 1941 to 2,600,000 cords in 1945. Inventories in the South fell 60% or 200,000 cords during this period, which is about the same amount of decline shown in the Appalachian region, 50%, while the Pacific Northwest showed a decline of 300,000 cords, or 43%. Inventories in the Lake States region remained virtually unchanged.

This depletion of inventories presents one of the greatest difficulties management had to contend with during the war. Obviously all mills were not faced with this problem but there were many mills, especially in the South, which operated on a "hand-to-mouth" basis and their pulp production schedules were closely related to the weather, availability of labor, trucks, and other items necessary for pulpwood procurement. Only by resourcefulness, ingenuity, and cooperation were these problems met so that both military and essential civilian requirements for pulp and paper products were fulfilled.

Canadian Situation

Imports of Canadian pulpwood during 1946 are expected to follow a pattern similar to that of 1945. The United States will receive a basic quota of 1,250,000 cords of wood from Canada and perhaps an

U. S. PULPWOOD STATISTICS (1941-1945 INCLUSIVE)
Receipts, Imports, Consumption and Inventories
(In Thousands of Cords)

	(1) 1945	1944	1943	1942	1941	% change 1945 vs: 1941
Receipts						
United States, total	17,013	16,998	15,293	17,140	16,458	+ 3.4
Domestic	15,315	15,349	13,581	14,908	14,177	+ 8.0
Imported	1,699	1,650	1,712	2,232	2,281	— 26.6
Northeast, total	3,386	3,039	2,954	3,399	3,486	— 2.9
Domestic	2,338	1,976	1,906	2,238	2,252	+ 3.8
Imported	1,049	1,063	1,047	1,161	1,235	— 15.1
Appalachian, total	1,398	1,482	1,303	1,475	1,412	— 1.0
Domestic	1,375	1,472	1,302	1,448	1,378	———
Imported	23	10	2	27	34	— 32.4
South, total	7,148	7,090	6,505	6,622	6,400	+ 12.0
Domestic	7,148	7,090	6,505	6,622	6,400	+ 12.0
Imported	———	———	———	———	———	———
Lake States, total	2,482	2,637	1,969	2,796	2,241	+ 10.8
Domestic	1,984	2,175	1,409	1,983	1,561	+ 27.1
Imported	498	463	560	813	680	— 26.8
Pacific Northwest, total (2)	2,598	2,750	2,561	2,948	2,918	— 11.0
Domestic	2,470	2,636	2,458	2,616	2,585	— 4.5
Imported	128	114	103	231	332	— 62.0
Consumption, total	16,911	16,754	15,645	17,275	16,580	+ 2.0
Northeast	3,243	3,159	3,265	3,530	3,515	— 7.8
Appalachian	1,443	1,490	1,442	1,498	1,420	+ 1.6
South	7,210	7,153	6,342	6,804	6,227	+ 16.0
Lake States	2,543	2,474	2,325	2,471	2,398	+ 6.0
Pacific Northwest (2)	2,471	2,482	2,271	2,972	3,019	— 18.2
Inventories, total (3)	2,639	2,819	2,846	3,392	3,729	— 29.2
Northeast	876	700	820	1,119	1,218	— 28.1
Appalachian	221	279	280	423	439	— 49.7
South	136	218	293	126	334	— 59.3
Lake States	986	1,088	962	1,313	995	— 0.9
Pacific Northwest (2)	420	534	491	410	742	— 43.4

Detail may not add to totals because of rounding.
(1) Estimated.
(2) Converted 600 board feet equal 1 cord.
(3) End of year.
Source: Sept.-Dec. 1945, inclusive—Bureau of the Census; other periods, Forest Products Bureau, War Production Board.

U. S. PULPWOOD CONSUMPTION BY REGIONS (1921-1940)
(In Thousands of Cords—and Percentage of Total)

	New England		Middle Atlantic		Lake States		Pacific Coast		All Other States*	
	Th. cds.	Pct.	Th. cds.	Pct.	Th. cds.	Pct.	Th. cds.	Pct.	Th. cds.	Pct.
1921	1,345	29.5	1,107	24.3	1,218	26.7	342	7.5	542	12.0
1922	1,647	29.7	1,277	23.0	1,512	27.3	346	6.2	764	13.8
1923	1,720	29.3	1,403	23.9	1,545	26.3	396	6.8	806	13.7
1924	1,601	27.8	1,312	22.7	1,561	27.1	436	7.6	856	14.8
1925	1,713	28.1	1,328	21.8	1,609	26.4	450	7.4	992	16.3
1926	1,832	27.1	1,416	20.9	1,844	27.3	538	8.0	1,133	16.7
1927	1,712	25.4	1,270	18.8	1,832	27.1	712	10.6	1,221	18.1
1928	1,732	24.2	1,207	16.9	1,840	25.7	959	13.4	1,420	19.8
1929	1,758	23.0	1,223	16.0	1,813	23.7	1,296	17.0	1,552	20.3
1930	1,513	21.1	1,116	15.5	1,679	23.3	1,351	18.8	1,535	21.3
1931	1,170	17.4	875	13.0	1,405	20.9	1,345	20.0	1,925	28.7
1932	969	17.2	675	12.0	1,224	21.7	953	16.9	1,810	32.2
1933	1,171	17.8	702	10.7	1,352	20.5	1,336	20.3	2,018	30.7
1934	1,110	16.3	694	10.2	1,305	19.2	1,525	22.5	2,160	31.8
1935	1,096	14.4	788	10.3	1,454	19.1	1,693	22.2	2,596	34.0
1936	1,191	13.7	878	10.1	1,665	19.1	1,933	22.2	3,047	34.9
1937	1,283	12.4	993	9.6	1,724	16.6	2,681	25.7	3,710	35.7
1938	1,336	14.5	810	8.8	1,496	16.3	1,792	19.5	3,758	40.9
1939	1,660	15.3	891	8.2	1,658	15.4	2,335	21.6	4,270	39.5
1940	2,080	15.1	1,064	7.7	1,866	13.6	3,069	22.4	5,661	41.2

*Chiefly Southern.
Source: Bureau of the Census: 1941-1944.

extra 500,000 cords of market wood after Canadian officials are able to estimate this season's cut some time around June. The quantity of Canadian pulpwood which will be available this year may be conditioned by withdrawal of prisoners of war from woods' operations.

Although several Canadian companies report an improved labor supply, the industry as a whole still has a major problem to solve in this respect, especially in the eastern provinces. In Quebec most of the woodlands labor is recruited from the ranks of marginal farmers who work for the pulpwood contractors only during the winter months, spending the spring and summer on their farms. Several of the larger Ontario woods camps have been dependent on German prisoners of war, some 8,000 having been working at various camps during the past year or so. Prisoners of war will not be available at all next winter.

PULPWOOD ANNUAL RECEIPTS AT U. S. MILLS

	Cords
Domestic:	
1945	15,315,000
1944	15,349,000
1943	13,581,000
1942	14,908,000
1941	14,177,000
Imports:	
1945	1,699,000
1944	1,650,000
1943	1,718,000
1942	2,232,000
1941	2,281,000
Overall:	
1945	17,013,000
1944	16,998,000
1943	15,293,000
1942	17,140,000
1941	16,458,000

Source—U. S. Bureau of Census for 1945. War Production Board, other periods.

The continued shortage of normal seasonal woods labor in eastern Canada has led certain companies to experiment with the development of all-year woods crews. They believe that by so doing the increased cost of cutting "out of season" will be offset by individual efficiency and at the same time they will be assured of a larger and more sustained supply of pulpwood.

An important step in this direction has been the increased use of mechanized methods — introduction of more tractors and trucks, power saws and other equipment designed to increase production per man while at the same time demanding the services of a more reliable and skillful class of labor.

Generally speaking, the shortage of woods labor, wherever it has prevailed in the east, has not been a question of low pay or poor camp conditions. Good cutters have been able to make from $15 to $25 a day. One of the Canadian regions in short labor supply during the past winter was the Great Lakes section. The situation was partly due to the slow return of woodsmen who had enlisted in war service and who were either taking their own time in going back to the old job or who had drifted away to occupations they regarded as more desirable. Another factor was the competition of the new Lake Superior pulp mills for manpower. Farther east, however, it was reported that many woods workers had taken jobs in the United States at higher pay. But over the whole eastern Canadian area conditions were generally better than during the wartime period. During the peak of the wood-cutting season in December-January it was estimated that about 57,500 men were in the woods, compared with 55,000 a year before.

U. S. PULPWOOD CONSUMPTION AND IMPORTS

(In Cords)

From Bureau of Census:

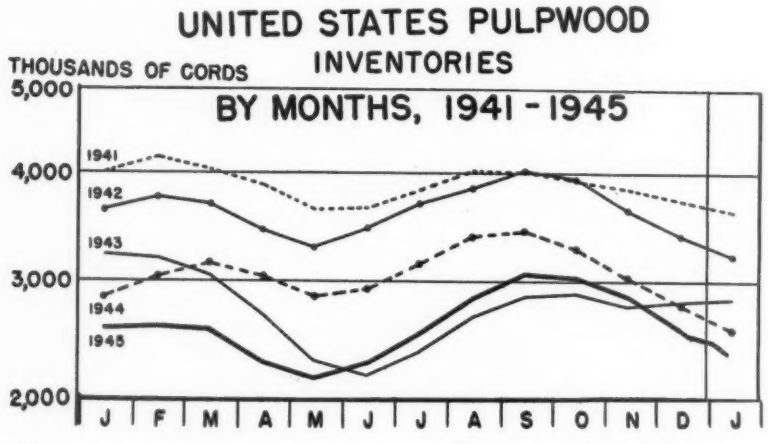
	Imports	Consumption
1929	1,350,722	7,645,011
1930	1,582,201	7,195,524
1931	1,021,667	6,722,766
1932	648,188	5,633,123
1933	723,208	6,581,674
1934	971,190	6,796,659
1935	1,037,332	7,628,274
1936	1,209,760	8,715,916
1937	1,522,868	10,393,800
1938	1,293,930	9,193,991
1939	1,130,874	10,816,466
1940	1,435,820	13,742,958

War Production Board figures:

(Except for 3rd Quarter, 1945, which are from Bureau of Census)

	Imports	Consumption
1941	2,281,000	16,580,000
1942	1,232,000	17,275,000
1943	1,718,000	15,644,500
1944	1,650,000	16,757,500
1945	1,699,000	16,911,000

Other tables on imports and exports of pulpwood on Pages 73 and 128.



Future Timber Resources Of North America

Turning to the long term view of pulpwood resources for the North American continent, there is every reason for the industry to be optimistic.

As we pointed out in an extensive survey of the subject in the 1945 North American Review Number, the U. S. Forest Service's figures over a period of a quarter of a century show a trend toward balance of timber drain and growth in the United States, with growth eventually steadily exceeding drain. It has long been held by U. S. Forest Service survey's that virtual elimination of timber loss from fire and insect ravages alone would have long ago balanced the timber picture.

But there have been other more recent developments resulting from both private industry's and public agency's investigations and initiative which brighten the outlook from other angles.

In the Southern part of the United States much greater production of pulpwood can and will be attained by the clearing of hardwoods from timber areas, by selective cut-

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The conclusion of the War found St. Regis Paper Company with an extensive record of production for victory and with a major reconversion problem in only one division.

The immediate and long-range demands for the wide variety of wood cellulose products manufactured and sold to more than a score of America's growing basic industries called for substantial expansion of production facilities in all divisions. This is being accomplished by construction of new plants, by modernization of equipment in present establishments, and through acquisition of additional properties.

Sales, which reached a new peak in 1945, are derived from a wide cross section of industry and commerce, and the diversification of products and end uses constitutes a measure of protection against the peaks and valleys of demands in the fields served.

Consolidating and supplementing the progress of the past ten years, the Company plans continuing development in all divisions.

Products — Light-weight printing, catalog, directory, book and specialty papers • Heavy duty multiwall bags, flour bags and sugar pockets • Kraft multiwall paper, shipping sack and other kraft specialties, rope stock • Bleached and unbleached kraft pulp • Bag making and bag filling machinery, replacement parts, and wire ties • Fabricated and molded laminated plastic parts, and sheets, rods and tubes.

Summary of Consolidated Income for the Year Ended December 31, 1945

Net Sales, Royalties, and Rentals	$52,500,824.42
Costs and Expenses	48,308,071.16
Operating Income	4,192,753.26
Income Credits	1,476,449.99
Gross Income	5,669,203.25
Income Charges	1,193,698.93
Net Income Before Provision for Income and Excess Profits Taxes	4,475,504.32
Provision for Income and Excess Profits Taxes	2,132,851.52
Net Income Before Deduction of Minority Interests	2,342,652.80
Deduct Minority Interest in Income	131,241.49
Net Income	$ 2,211,411.31

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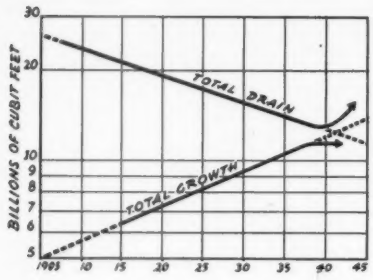

TRENDS OF GROWTH AND DRAIN IN U. S. FORESTS

U. S. Forest Service surveys 1920-1936 are basis for this diagram which shows growth and drain were heading toward a balance in about 1942. After that date, growth would exceed drain.

But, heavy cutting for World War II disrupted the trends, as shown by the arrows.

PULP & PAPER INDUSTRY is informed in letter from Office of Chief U. S. Forester that growth and drain already has reached a balance in most regions.

ting and thinning and by converting extensive areas which are not now productive to timber growth. The Southern possibilities are discussed in more detail in a section which follows and which is devoted to that area. The possibilities for increased timber yield in the South are truly amazing.

Pacifc Coast "Revolution"

In the Far West of both the United States and Canada, a veritable "revolution of wood utilization" is already well-advanced. Frequent articles in this journal have kept our readers up to date.

Hydraulic wood barking and whole log chipping is increasing pulp yield from wood 10-20%, so much of the big western wood having been lost in saw kerf in reduction to cants and also with the thick bark.

Development of new light machinery to clean up forests, where much wood was left as waste in the past, in some cases will bring 20 to 30 more cords an acre to the mills.

And finally, a shift now under way to the use of second growth Douglas fir, made possible by improved pulp manufacturing processes, promises to quickly put Pacific Coast mills on a sustained yield basis. Some mills will use from half fir to all fir in lieu of the historic hemlock — which had been thought their only suitable pulpwood in the past for almost all quality pulps.

U. S. STAND OF PRINCIPAL SPECIES NOW COMMONLY KNOWN IN PULP AND PAPER MANUFACTURE

(Except for Pacific Northwest, where it estimates a downward revision, the U. S. Forest Service says these figures are approximately accurate for this year. However, in the Pacific Northwest, a trend toward use of species uncommon to pulp and paper use is excepted to balance stands in that area.)

Kind of Wood:	Total	North-eastern	Central	Lake	South	Pacific Northwest
		(thousand cords)				
Softwoods:						
Spruce and Fir[1]	542,314	50,961	.....	29,997	1,400	248,593
Hemlock	330,288	19,567	59	33,774	9,800	267,088
So. Yellow Pine	630,795	8,751	1,993	.....	620,051	.....
Other Pines	78,534	38,765	18	35,567	4,184	.....
Tamarack	3,093	14	.....	3,079	.....	.....
Total	1,585,024	118,024	2,070	102,417	635,435	515,681
Hardwoods:						
Cottonwood[2]	66,118	12,342	892	43,776	5,614	3,221
Yellow Poplar	49,917	3,490	996	.....	45,431	.....
Birch[3]	296,383	183,816	10,355	88,162	14,050	.....
Gum	249,685	2,601	1,967	.....	245,117	.....
Total	662,103	202,249	14,210	131,938	310,212	3,221
All Species	2,247,127	320,307	16,280	234,355	945,647	518,902

[1]Total includes 104,034 thousand cords in California and 107,329 thousand cords in South Rocky Mt. region. [2]And Aspen. [3]And Beech and Maple.

Source: U. S. Forest Service, 1936-38 Revision.

The Forest Service calculated a balance of drain (after allowance for growth) of 5.7% in 1936. If this were taken as an average for each year since then, the above total for all species in 1936-38 would be reduced to 2,126,818 thousand cords in 1945-7. However, there are many reasons why the 1936 drain figure cannot be accepted as average. Both growth and drain increased in war years, but drain undoubtedly will be reduced substantially in postwar years while the growth rate increases. Now, the U. S. Forest Service has informed PULP & PAPER INDUSTRY that growth and drain are "in close relationship" in all areas except the Pacific Northwest and that above figures, therefor, still hold good for those other areas.

TOTAL U. S. STAND

Estimated in 1938 by Forest Service

(In Million Cu. Ft.)

	Soft-wood	Hard-wood
Northeast	12,915	34,986
Central	419	11,582
Lake States	8,970	16,839
South:		
Coast	23,457	15,799
Piedmont	20,108	18,454
Mountain	3,240	16,751
Delta	918	10,779
West	14,446	14,062
Total	62,169	75,845
Pac. Northwest:		
Coast	122,446	2,642
Interior	71,710	281
Total	194,156	2,923
California	62,582	.....
So. Rocky Mts.	35,653	24
Total	376,876	142,199

U. S. FOREST AREAS

(In Thousands of Acres)

	Total Commercial Area	Pct.	Total Old Growth
Northeast	59,376	13	8,002
Central	29,231	6	367
Lake States	52,395	11	3,586
South:			
Coast Plain	62,534	14	9,430
Piedmont	49,372	11	4,958
Mountain	38,408	8	2,538
Delta	12,324	3	3,346
West	39,893	8	4,856
Total	202,531	44	25,128
Pacific Northwest:			
Coast	25,790	6	10,987
Interior	48,052	10	26,219
Total	73,842	16	37,206
California	13,655	3	8,653
So. RockyMt.	30,653	7	17,889
Total	461,697	100	100,832

Changes in East

In the Eastern United States and Canada, shifts to using birch, beech, jackpine and other less commonly known pulpwoods from their traditional spruce, made possible by new kraft and groundwood processes and bleaching, are adding hitherto uncounted timber resources to back up and revivify old pulp and paper operations. Use of hardwoods for pulp is increasing everywhere. They are not only finding that clearing away of hardwoods makes room for more fast growing pine in the South, but the first all-hardwood pulp mill has been projected for that area.

Thus, some of the old statistics on "pulpwood resources" are inaccurate because they never counted some of these species of woods now being utilized. One thing we have learned is that timber growth rates in the Far West, especially, as well

A recent order from a Prominent Pulp and Paper Manufacturer

comprises the following

GENERAL AMERICAN EQUIPMENT

DIGESTERS and BLOW TANKS

COMPLETE RECAUSTICIZING PLANT

LIME RE-BURNING KILN INSTALLATION

BLACK LIQUOR EVAPORATOR STATION

BINS and TANKS

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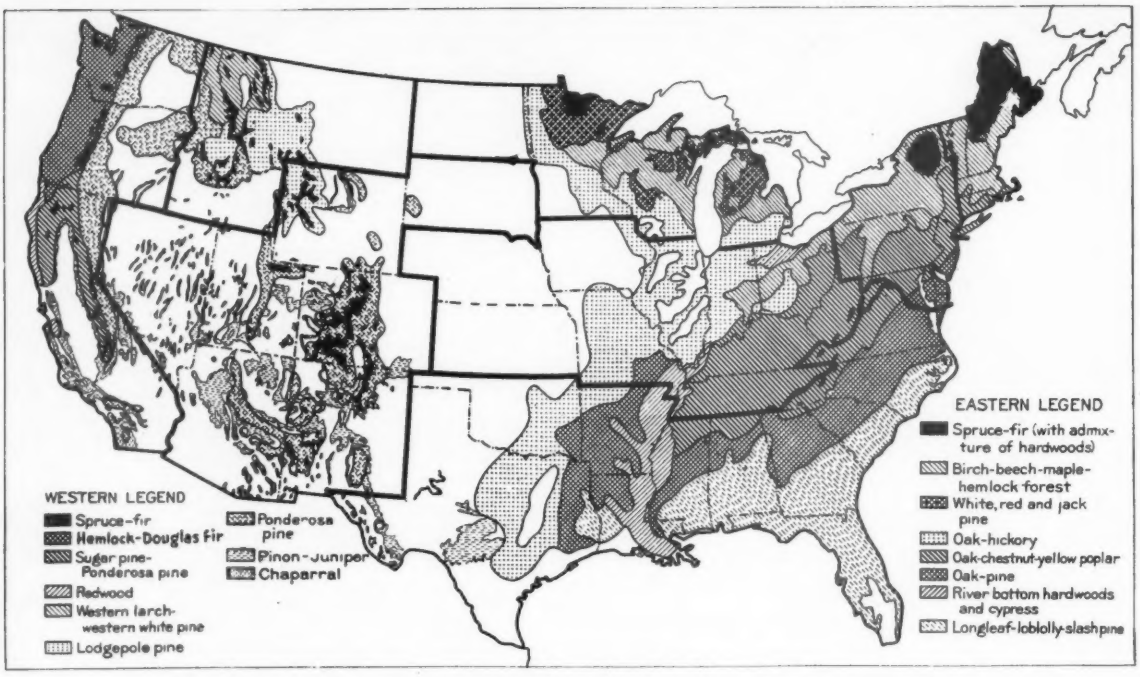
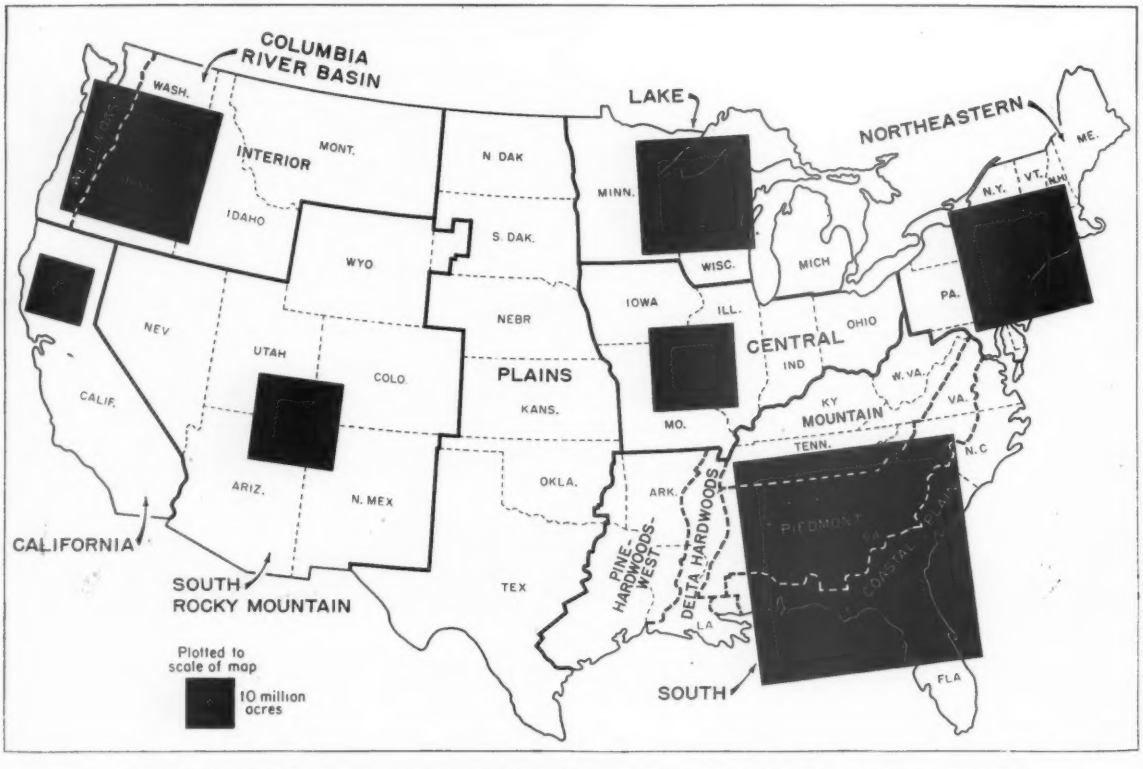


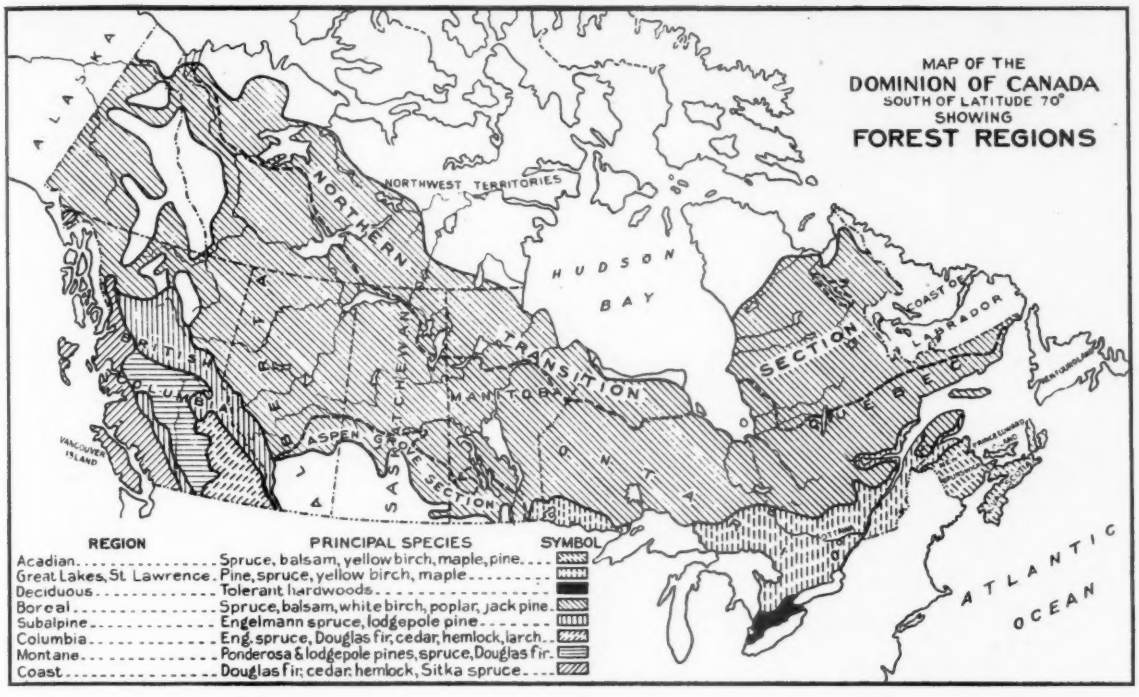
PRINCIPAL FOREST TYPES AND THEIR LOCATIONS IN UNITED STATES

(From Statistical Bulletin of Department of Agriculture)



COMPARATIVE SIZES OF COMMERCIAL FOREST AREAS IN UNITED STATES

(Compiled by U. S. Forest Service)



as in other regions, are increasing rapidly as more old first growth timber is cleared. About 100 million acres of old timber areas in the U. S. have no net growth whatever at the present time. Unfortunately, there is much old growth timber locked in government reserves which may die and rot without being used.

AFA Appraisal

The U. S.-wide forestry appraisal sponsored by private industries and conducted by the American Forestry Association is just about concluded as far as the field work in 34 states is concerned. Now starts the preparation of the long-awaited nationwide report.

Giving PULP & PAPER INDUSTRY readers an advance "tip" on the appraisal, Capt. John B. Woods, the director, told this magazine that it indicates previous estimates of growth of timber have been too low.

"It appears that there is probably more wood of all sizes standing today in our forests than past studies would lead us to believe," he said. "Traditionally, we think of timber inventories and of growth and drain in terms of sawtimber. For some time foresters have contended that the estimates of yearly timber depletion put out by authoritative agencies have been a bit low. We are disposed to agree with this view

Domestic and Foreign Pulpwood Consumed in the United States by Decades, 1860-1939

Decade	Total 1,000 cords	Domestic 1,000 cords	Imported 1,000 cords	Per Cent of Total Imported
1860-69	15	15	----	----
1870-79	215	215	----	----
1880-89	3,120	3,120	----	----
1890-99	12,845	11,000	1,845	14
1900-09	30,758	24,601	6,157	20
1910-19	47,981	39,248	8,733	18
1920-29	62,277	50,780	11,497	18
1930-39	79,678	70,598	9,080	11
Total	236,889	199,577	37,312	16

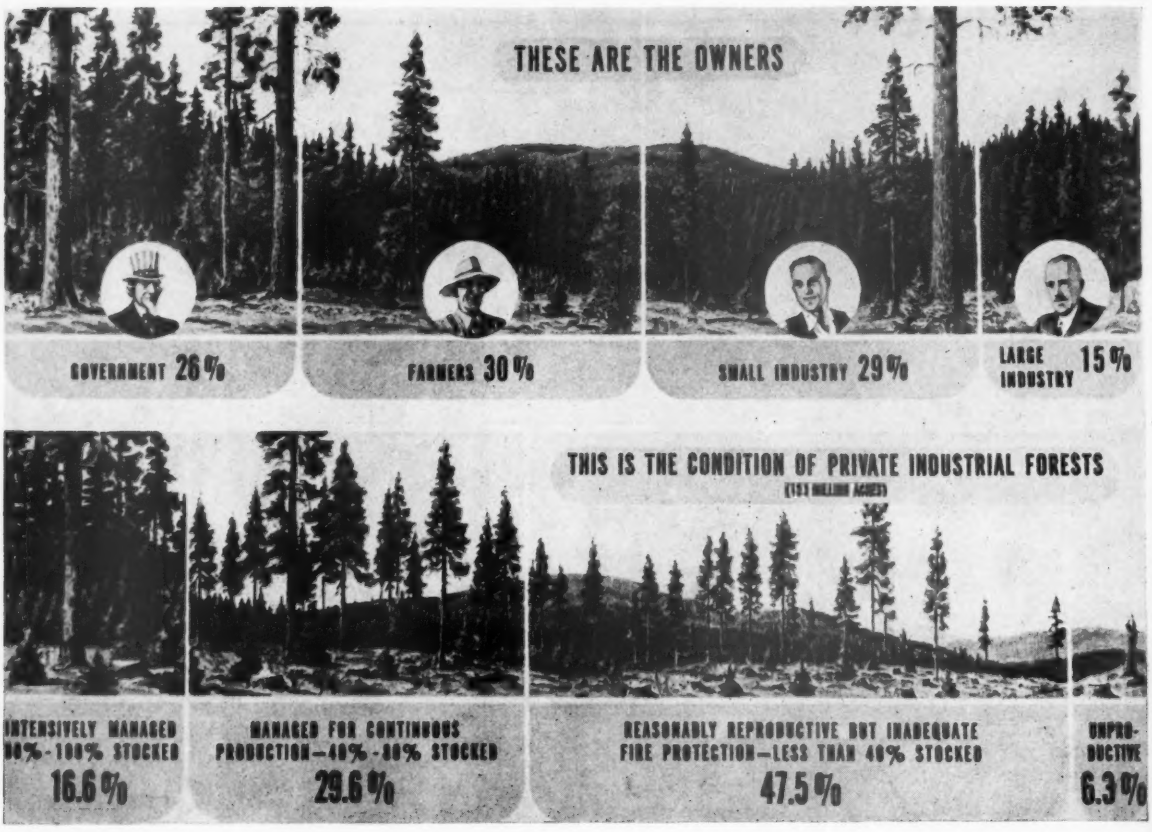
Souce: U S. Forest Service.

COMPARISONS OF U. S. PULPWOOD CONSUMPTION BY SPECIES

(In Thousands of Cords)

	1937	1939	1941	1944
Southern Pine	2,659	3,834	6,402	6,841
Spruce	2,836	2,133	[1]3,671	[2]3,689
Balsam Fir	391	357		
Hemlock	2,264	2,218	[3]3,563	2,246
Poplar	531	477	[4]966	----
Jack Pine	300,786	359,755	[5]501,000	----
Balsam Fir—Domestic	320,715	283,506	[6]	----
Imported	71,447	74,705	[6]	----
Beech, Birch and Maple	257,410	241,039	344,000	----
White Fir	135,384	159,428	----	----
Other	412,692	373,975	658,000	----
Slabs and Mill Waste	565,391	319,014	[6]	----
Aspen	----	----	----	661,710
Yellow Poplar	----	----	----	284,882
Chestnut	----	----	----	434,982
Birch	----	----	----	8,377
Gum	----	----	----	160,166
Mill Waste and Cordwood	----	----	----	287,335
Miscellaneous[6]	----	----	----	988,873
Total Pine	----	----	----	7,994

[1]Excludes western spruce. [2]Includes western spruce and white fir. [3]Includes tamarack, other eastern softwoods. [4]Includes aspen, cottonwood. [5]Not available. [6]Includes jack pine, cottonwood, ak, maple, willow.


THESE ARE THE OWNERS
GOVERNMENT 26%
FARMERS 30%
SMALL INDUSTRY 29%
LARGE INDUSTRY 15%
THIS IS THE CONDITION OF PRIVATE INDUSTRIAL FORESTS
(153 MILLION ACRES)
INTENSIVELY MANAGED 80%-100% STOCKED 16.6%
MANAGED FOR CONTINUOUS PRODUCTION—40%-80% STOCKED 29.6%
REASONABLY REPRODUCTIVE BUT INADEQUATE FIRE PROTECTION—LESS THAN 40% STOCKED 47.5%
UNPRODUCTIVE 6.3%

According to American Forest Products Industries, the ownership of a grand total of 461,000,000 acres of commercial forests in the U. S. is divided as shown in the above diagram.

Farmers are the largest owners. That is why pulp and paper companies are more and more turning to farmers' wood—even now in the Pacific Northwest, where this practice was unheard of a few years ago. The South has progressed rapidly in development of this market.

as regards cutting for industrial consumption, but it is questionable whether the actual yearly drain in fuelwood and on account of fire, insects, disease and storm has been much larger than the year by year estimates. On the other hand, we believe growth of timber in all sizes has been under-estimated in practically all parts of the country. It may be readily seen that even a slight favorable balance extended over a decade would account for some surprises, particularly in cordwood and smaller sizes.

"Presumably there will be a considerable increase in consumption of pulpwood and in general it would appear that such a development is possible. Natural regeneration and planting have provided an increasing base for pulpwood production in the Lake and Central States. In the South improved forest practices may keep pace with species deterioration and so provide a continuing supply for southern mills. The picture is difficult to analyze in the Northeast because, although

U. S. GROWTH AND DRAIN (1936)
(In Million Cu. Ft.)

	Growth	Drain	Ratio drain to growth
Northeast	1,260	1,370	1.1
Central	568	907	1.6
Lake States	979	983	1.0
South:			
Coast	1,626	1,091	1.0
Piedmont	2,143	1,812	0.8
Mountain	893	1,487	1.7
Delta	478	573	1.2
West	1,355	1,126	0.8
Total	6,495	6,689	1.0
Pac. Northwest:			
Coast	917	1,833	2.0
Interior	717	1,016	1.4
Total	1,634	2,849	1.7
California	155	501	3.2
So. Mts.	196	164	0.8
All regions	11,287	13,463	1.2

Source—U. S. Forest Service.—128 cu. ft. equals one cord.

forest management is understood, the tendency has long been to cut so closely upon much of the land that growth is not fully realized upon. Also there is a threat of insect losses which may be staggering. From the Rocky Mountains westward, there is, of course, a vast storehouse of pulping species."

New Pulp Timberlands

Uses of wood for fuel, for sawmills, shingle mills, lath and cooperage has declined sharply over the years, with pulp, paper, plastics, glass, steel, tin, clay, etc., replacing many wood uses. Even with the wartime spurt in timber cutting, the rate of this cutting for commodities was only about 60-65% of the rate of timber cut for similar purposes 40 years ago.

In the past few years, hundreds of thousands of acres of timberlands in the South and the Far West, which supported big sawmills, have passed to the hands of big pulp companies and will hereafter be

New and wider uses for paper have been created by PAREZ resin 607, the synthetic paper resin that imparts superior wet and dry strength to all types of raw stock.

Soon, because of these unprecedented characteristics, wet strength paper may successfully replace cloth in the manufacture of bed sheets, pillow cases, towels, wash cloths, handkerchiefs, table cloths and napkins, and diaper backings.

The success of such new applications is assured by the remarkable performance of wet strength paper in wartime maps, toweling, food wrappers, containers, shipping tags, and field note books. Wet strength paper has also come into its own in the manufacture of absorbent papers, bag and sack papers, saturating papers, photographic papers, poster papers, twisting papers, and wrappings.

PAREZ 607 can be added directly to the fiber finish during paper manufacture. It serves to bind the fibers together with a bond that is insoluble in water and most other liquids. As the paper comes off the machine, tests reveal outstanding improvements in bursting and tensile strength, along with a pronounced increase in folding endurance. Furthermore, PAREZ bonding does not adversely affect such properties of paper as color, opacity, or surface characteristics.

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CANADIAN PRODUCTIVE FORESTED AREA

	Square Miles	%
Softwood or coniferous	467,775	60.7
Mixed softwoods and hardwoods	210,390	27.3
Hardwood or broad-leaved	92,400	12.0
Total	770,565	100.0

Source: Dominion Forest Service.

AVERAGE ANNUAL CUT OF TIMBER AND ITS USES

Based on the 10-year period, 1930-1939

	Million Cu. Ft.	%
For fuel	863.8	34.3
For sawmill products	797.6	31.7
For pulp and paper	706.3	28.0
For hewn ties, poles, logs, etc.	151.3	6.0
Total	2,519.0	100.0

Source: Dominion Forest Service.

DISTRIBUTION OF ACCESSIBLE STANDING TIMBER IN CANADA

All Species

	Million Cu. Ft.	%
Maritime Provinces	15,790	7.5
Quebec	81,931	38.7
Ontario	71,032	33.6
Prairie Provinces	24,577	11.6
British Columbia	18,326	8.6
	211,656	100.0

Source: Dominion Forest Service.

CANADIAN PULPWOOD SPECIES — CURRENT ESTIMATED VOLUMES

(Provided for this issue of PULP & PAPER INDUSTRY by the Dominion Forest Service)

Material of Sawlog Sizes*

In Millions of Board Feet†

	Spruce	Balsam	Jack and Lodgepole Pine	Hemlock	Poplar	Total
Prince Edward Island	75	25	.....	.....	5	105
Nova Scotia	2,714	789	.....	684	5	4,192
New Brunswick	3,102	1,202	248	210	.....	4,762
Quebec	32,286	17,701	1,847	72	2,540	54,446
Ontario	27,901	.....	11,914	793	3,292	43,900
Manitoba	778	5	71	.....	1,610	2,464
Saskatchewan	2,960	30	620	.....	2,420	6,030
Alberta	9,000	400	3,000	.....	4,500	16,900
British Columbia	50,222	31,484	9,782	56,662	.....	148,150
Total	129,038	51,636	27,482	58,421	14,372	280,949

Smaller Material‡

In Thousands of Cords

Prince Edward Island	600	80	.....	5	10	695
Nova Scotia	6,702	15,639	26	256	840	23,463
New Brunswick	30,383	16,286	2,217	66	3,943	52,895
Quebec	513,397	287,747	40,048	1,048	22,079	864,319
Ontario	209,217	29,223	61,713	500	125,073	425,726
Manitoba	6,877	385	3,253	.....	18,800	29,315
Saskatchewan	8,290	355	2,830	.....	53,800	65,275
Alberta	50,000	1,550	90,000	.....	90,000	231,550
British Columbia	84,995	69,936	313,201	20,460	.....	488,592
Total	910,461	421,201	513,288	22,335	314,545	2,181,830

Total Pulpwood Species

Equivalent Volumes in Millions of Cubic Feet of Standing Timber (Includes Sawlogs and Smaller Material)

Prince Edward Island	86,625	14,835	.....	585	2,045	104,090
Nova Scotia	1,378,500	2,002,554	3,042	179,748	80,895	3,644,739
New Brunswick	4,234,149	2,168,700	313,701	53,712	374,585	7,144,847
Quebec	67,138,083	37,542,918	5,090,109	138,384	2,653,765	112,563,259
Ontario	30,588,708	3,419,091	9,829,587	232,167	12,602,883	56,672,436
Manitoba	974,991	46,140	396,150	.....	2,138,590	3,555,871
Saskatchewan	1,618,170	48,105	466,890	.....	5,640,980	7,774,145
Alberta	7,821,000	268,950	11,187,000	.....	9,535,500	28,812,450
British Columbia	20,943,033	15,077,508	38,786,775	14,802,798	.....	89,610,114
Total	134,783,259	60,588,801	66,073,254	15,407,394	33,029,243	309,881,951

*Probably only a minor portion of this wood will be used for pulp.
†Approx. 500 bd. ft. equals one cord. Very little of this, however is cordwood or pulpwood. The total figure in this table, 280,949 million bd. ft. equals about 562 million cords.
‡Mostly pulpwood.

DOMINION OF CANADA TIMBER VOLUME AND ANNUAL DEPLETION

Based on the 10-year period, 1930-1939

			Million Cu. Ft.	
Total stand of timber of merchantable size			313,140	
Total stand of such lumber accessible			211,656	
Average cut for domestic and industrial use:				
For fuel	863.8	23.8%		
For sawmill products	797.6	21.7%		
For PULP and PAPER	706.3	19.5%		
For hewn ties, poles, logs, etc.	151.3	4.5%		
Total			2,519.0	69.5%
Loss of timber by fire			404.0	11.2%
Loss by fungus, insects, etc.			700.0	19.3%
Total consumption by all agencies			3,623.0	100.0%

Total average annual consumption, therefore, represents 1.7 per cent of the stand of accessible timber of merchantable size.
Source: Dominion Forest Service.

devoted to fast-growing pulpwood.

Many areas in the U. S. that were cleared for farming have been found to be better suited for their historic purpose — timber growing. After farmers have failed and gone, these lands in the Washington, Wisconsin, the South and the East, have reverted to timber.

The Forest Service, in reporting new growth in the U. S. of 11,287,000,000 cubic feet in 1938, proposed a national goal almost twice as great—21,400,000,000 cubic feet of annual new growth. Perhaps it wouldn't take much to make even this figure seem small.

Canadian Resources

Canada is still, of course, an area of vast stretches of old growth timber.

Only two other countries in the world possess greater forested areas —Soviet Russia and Brazil.

In eastern Canada the drain on these resources has been well within the extent of natural regeneration of the forest and on the west coast where a long-term program for sustained yield is now being evolved there appears to be more timber suitable for pulpwood than for almost any other purpose.

Total land area of Canada is about 3,500,000 square miles. Of this, about 1,200,000 square miles are forested. Not all this forest is productive, but the productive area measures 770,565 square miles — roughly equal to the combined area of the United Kingdom, France, Spain, Portugal, the Netherlands, Denmark and Sweden. This represents 22.2%, or more than one-fifth of the total land area of Canada, but in the nine provinces of Canada 38% of the land area con-

PROGRESS in CONSERVATION of TIMBER

By Improved Methods and Machinery In Producing High Grade Pulp Chips

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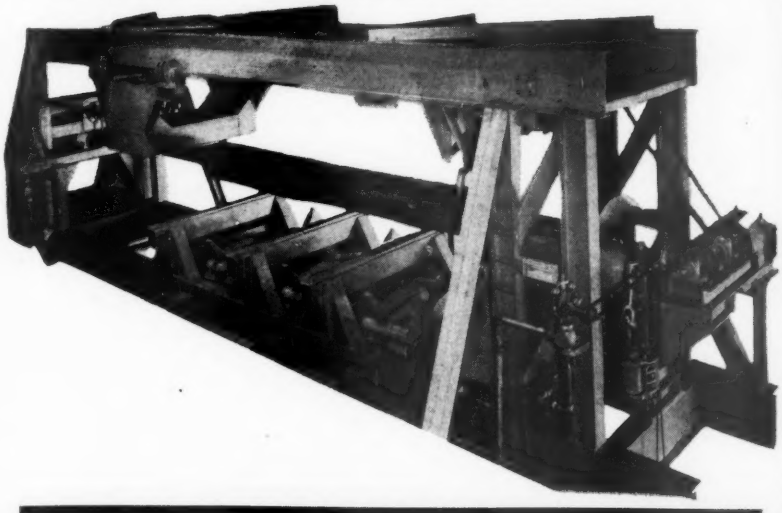
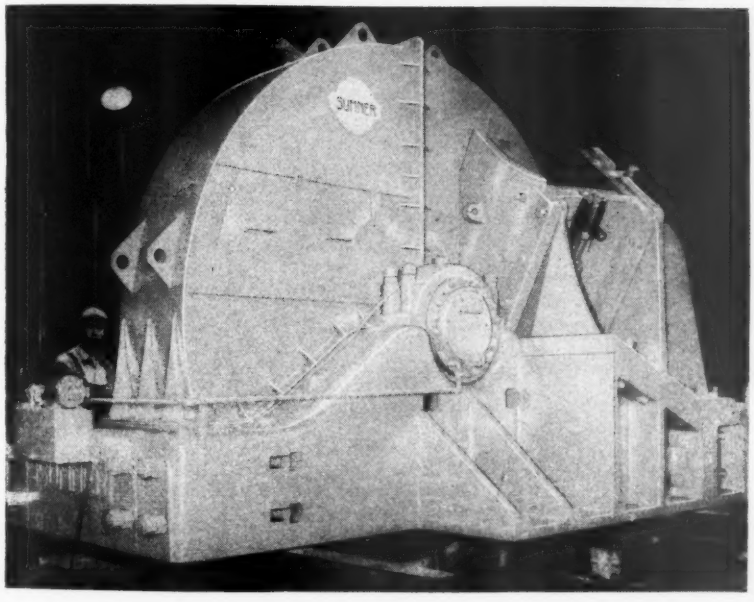
MACHINERY FOR COMPLETE WOOD ROOM PLANTS FOR CONVERTING LOGS INTO PULP CHIPS





SUMNER BUILT

Crown-Zellerbach Type—Pat.

Hydraulic Log Barker in operation at Hawley Pulp & Paper Co., Oregon City, Ore.

Barks logs maximum size 52 inches diameter 22 feet long.

Equipped with controls for one-man operation; for charging, centering, barking and discharging logs.

SUMNER

Round Log Chipper with coupled motor drive. In operation at Soundview Pulp Co., Everett, Wn.

This huge machine produces chips at a rate unequaled by any other chipper. Designed and built to the recognized Sumner standards of quality, pulp wood chippers are also available in several smaller sizes.

Write for complete information.

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In Canada: **CANADIAN SUMNER IRON WORKS, VANCOUVER, B. C.**

sists of productive forests. The forests of the Yukon and the Northwest Territories are at present only of local value.

Of the 770,565 square miles of productive forest, 430,000 square miles are accessible. In the productive forest area more than half is young growth; the remainder is already of merchantable size.

Of the forest areas now regarded as economically inaccessible it is probable that in future a considerable proportion will prove of commercial value, depending on the provisions of transportation facilities and rising values. In the nine provinces of Canada the productive forested areas alone are nearly four times the area at present devoted to farming.

Climate, topography and soil conditions determine the location.

Of the 130 distinct species of trees found in Canada, only 33 are conifers or softwoods such as the pulp and paper industry principally uses, but they comprise more than 75% of the standing timber and 80% of the wood used for all purposes.

Spruce and balsam are the predominant pulpwood species in eastern Canada just as hemlock and balsam are outstanding in British Columbia, but there are indications that other species will be increasingly used as new utilization processes are developed and as stands of the more popular species are reduced in certain areas.

In the east, white pine, jack pine and poplar are still regarded as inferior pulpwood, but the trend towards kraft production,, especially in Ontario, has presented an opportunity for much greater use of jack pine as well as other species hitherto neglected.

In British Columbia almost every major softwood species has been used to some extent in pulp manufacture, but hemlock still represents about 60 per cent of the total pulpwood used.

Alaskan Timber

A great virgin area for future development of a North American pulp and paper industry is Alaska. No mills exist there now and it may be some years before all economic factors make such a mill practicable.

Private industry executives who have looked into the possibilities in Alaska state that good stands are scattered, although many stands are close to the water. Other factors which previously had been known to delay any expansion in Alaska have been high cost of building a mill and mill town and the threatening and uncertain policies of U. S. Department of Interior in aggrandizing control over Alaskan resources.

(All of the pulpwood in Alaska is in the U. S. Forest Service (Dept. of Agriculture) hands at present, as it's all in Tongass National Forest which cover most of Southeast Alaska. For the second time in 15 years, the Forest Service has sought to lease these timberlands for pulpwood production. It does not permit export of the wood out of Alaska.

The present offer, which actually has not been withdrawn, for about 14 million cords (7½ billion feet) of hemlock and spruce in the Ketchikan region of the National Forest, to support a mill of 150 tons daily pulp capacity for ten years and 525 tons for the succeeding 40 years. These are terms of the U. S. Forest Service offer and there are many other terms already stipulated, which would include an agreement that timber be paid for in installments of at least $10,000, that a surety bond of $50,000 guarantee performance and that "substantial deposit" of perhaps $100,000 accompany any bid. Of course, cutting of timber would be rigidly controlled.

South Leads --And It Is Learning, Too

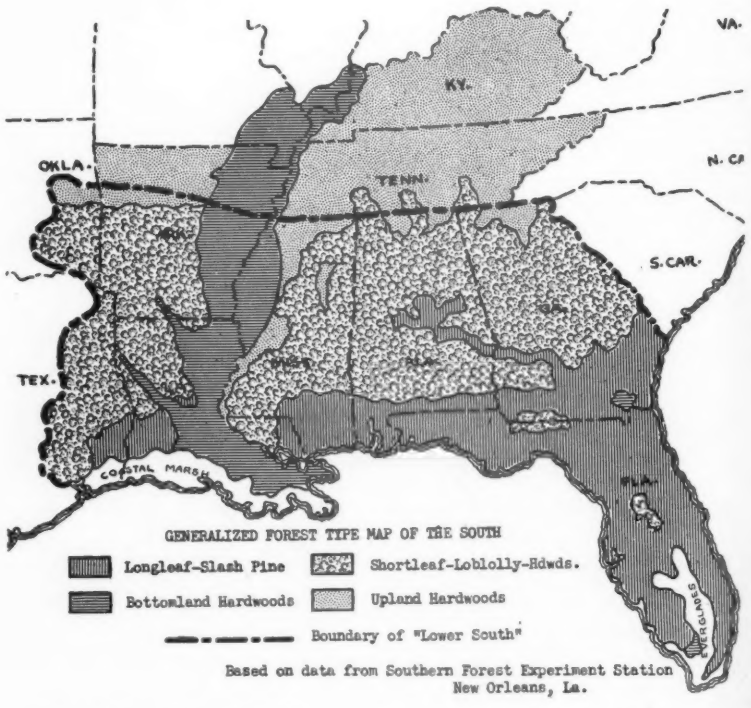
As a producer and consmer of nearly half of the pulpwood in the U. S., the Southern tier of states is dealt with in more detail in this section.

This magazine's own "on-the-spot" survey in the South reveals that production was maintained in 1945 by (1) prisoner-of-war labor, (2) utilization of every form of mechanical aid possible; and (3) extension of pulpwood operations to areas at distances from the mill, which under ordinary circumstances would not have been undertaken. Production apparently slightly exceeded 1944 figures.

While production held its own, it is the concensus among state forestry authorities that the overall drain of forest stands declined as against 1944.

In the overall picture, a factor operating to bring about improvement of stand has been the cumulative effect of selective cutting and protection of young growth, a result of which has been an increase in the total volume.

In compilation of pulpwood yield estimates from federal versus state sources south of the Potomac, but



THESE PICTURES SHOW GRAPHICALLY THE POSSIBILITIES OF PINE GROWTH IN THE SOUTH.

At left are two pictures of Gomer D. Evans, Jr., son of Alabama Power Co. forester. In small inset, taken 10 years ago, he is the small boy inspecting a couple of the 7 million pine seedlings which were set out by the company. Larger picture shows the grown boy at the same location in February, 1946. The boy is a veteran of the 1945 Philippines campaign. The seedlings have become 25-30 foot high trees, averaging 6 in. diameter. In another three years they will be ready for Alabama's paper mills.

Middle picture—a wild, dense stand of low grade hardwoods in Crossett (Ark.) Experimental Forest and — —

At right—the same area five years later after improvement cutting removed unwanted hardwood, permitted pine to thrive.

excluding Kentucky, estimates run substantially above previously published figures. Wood receipts at mills are shown in the government table published with this article at 7,148,000 cords but other estimates range as high as 8,359,000.

The pulp and paper industry in the South during the war years experienced sharp competition from the smaller sawmills which were able to pay higher prices to independent land owners for trees cut for the lumber market, in contrast with limiting OPA ceiling prices in the paper industry. This sharp competition rendered it more difficult for pulpwood contractors and small mill loggers to resist the well known "take all" type of independent land owners, particularly in the face of short labor and hard transportation equipment maintenance. Pulpwood easily reached by improved highways and/or rail had a positive value in keeping the mill going.

War demands for vast amounts of box and other low lumber grades made possible extensive improvement cutting of forest stands on which it had been thought the removal of low grade trees was impractical.

Economics of Clearing Hardwoods

This idea of an impracticality of clearing off of undesirable trees was exploded by R. R. Reynolds of the Southern Forest Experiment Station, who reported in a Texas Chemurgic meeting that it is feasible to sustain the expense of clearing the way for desired fast-growing pine. The station, he said, since 1937 has had a 1680-acre tract of mixed stand under its experimental guidance. When the station took over this area the tract contained a fairly good stand of second growth pines ranging in size from about 4" to 20" in diameter. It also contained a very large number of extremely low grade hardwoods of many species. Some of these were of quite large size, but because of poor quality they were left at the time the virgin timber was cut in 1915. For the most part though, these hardwoods were from 4" to 10" in size.

In some few places these low grade hardwoods occupied only a small portion of the effective growing space, and in others they covered entire areas solidly with little or no chance for pine to become established or to grow. It was estimated that these trees occupied or would have occupied nearly 50% of the growing space. Since it was thought that reasonably well stocked stands of pine would grow at the rate of 400 feet per ace annually, with pine stumpage at at least $10 per M board feet, each year low grade hardwoods were allowed to take up half the site, there would be a minimum loss of $2 per acre. In 10 years there would be a potential loss of $20 per acre.

Mr. Reynolds indicated that a better than average opportunity to market hardwoods made possible its elimination a matter of breaking even. Results obtained include dense pine stands of nearly pulpwood size in areas that in 1939 were almost completely taken over by hard-

Pulpwood (Only) Increment and Drain In Lower South

(In Cords)

	Net Increment	Commodity Drain	Relation of Increment to Drain
Ala.	7,779	7,484	104
Ark.	6,902	6,636	104
Fla.	2,300	3,558	65
Ga.	8,752	5,402	162
La.	6,960	6,260	111
Miss.	7,813	7,312	107
Okla.	485	764	63
Tex.	6,357	4,541	140
Total	47,348	41,957	113

Source: U. S. Forest Survey.

woods. The number of pine seedlings, saplings, and poles per acre increased several hundred percent, and the growth rate of the entire stand has expanded. Where there are pine seed trees or pine reproduction, it may be good business to cut or girdle the hardwoods inasmuch as the Crossett studies indicate that as much as $9 per acre can be expended for removal purposes with this return in additional pine growth over a 10 to 12 year period. Where pine reproduction is not present, planting of pine is indicated.

The admonition to pulp and paper mills to turn themselves to intensified forest culture on company lands, voiced by Capt. I. F. Eldredge in the Atlanta meeting of the Southern Pulpwood Conservation Association, was substantiated by the testimony of Mr. Reynolds who pointed to the experience of the Crossett forest as a standard. On 1,000 acres where tests of the possibilities of partial or selective cutting were conducted, it was found that the return per acre is in proportion to the amount of growing stock. If you have 1,000 feet or two cords of pulpwood per acre, said Mr. Reynolds, you probably will grow about 80 bd. ft. of logs or .2 of a cord of pulpwood per acre per year. On the other hand, if you have a growing stock of 6,000 to 10,000 bd. ft. or 12 to 20 cords of pulpwood per acre, the growth might well be 400 bd. ft. or 1.5 cords per acre per year.

The returns on the two cords of pulpwood per acre land may run from 20c to 50c per acre a year, or hardly enough to pay the cost of holding the land. On the other hand, a well stocked stand may return from $1.50 to $5.00 per acre-year.

On selective cutting from 1,000 acres it was found that partially because of removal of low grade hardwoods and partially as a result of removal of slow growing, limby, defective and suppressed pine, the growth rate of small size trees was increased about 30% and the growth rate of saw timber size trees nearly 70% since the tract was placed under the management of the station in 1937.

It is true that the Southern pulpwood industry has turned to the use of mechanical aid, but it is equally true that this same characteristic American trait is being exercised in the reforestation process with a possible result that, with mechanical aid for intense forestry practice, the Southern wood pulp industry may attain a new goal.

HOW MANY $ IN MY FARM TREES?

These boys are learning how to estimate the amount of wood that can be cut from standing trees which will help them in selling forest products from their farm woods. This is one of the study groups of sixty Georgia farm boys attending the recent one week Forestry Training Camp held at the Laura S. Walker State Park near Waycross, Georgia. The camp was sponsored by the Southern Pulpwood Conservation Association as a part of its program to encourage and demonstrate the proper care and treatment of the South's forests.

The camp was financed by the two Georgia member mills of the Association, Union Bag & Paper Corporation and Brunswick Pulp and Paper Company due to their interest in this objective. The 4-H Club Division of the Georgia Extension Service operated the camp and selected outstanding farm boys interested in forestry to attend the camp. The teaching staff was provided by the Georgia Division of Forestry. Besides timber estimating the boys learned something about fire prevention and control, tree identification, selection of trees to be cut for various products, and other practices helpful in the care and management of their woodlands.

The member pulp and paper mills of the Southern Pulpwood Conservation Association have as their ultimate objective providing, in cooperation with state agencies, this type of vocational forestry training each year to about 1,000 farm boys throughout the southern states.

For mill wood procurement operators the result of a study made by the Crossett experiment station and reported by Mr. Reynolds at the Texas Chemurgic meeting, may serve as a useful text in stimulating sustained production among farm woodlot owners within the most desirable transportation distances. In 1937 a 40-acre tract of mixed stand was selected for management as a farm woodland. From this area each year a volume of forest products approximately equal to the growth of the stand during the year was cut. The first taking was of fuel wood and posts for the farm, with the remainder taken off as cash crops for the market. The products removed from the 40 acres during 1945 included 13,144 board feet, Doyle scale, of logs; 15.33 standard cords of pulpwood; 11.97 standard cords of fuel wood, and 42 posts. The stumpage value was $197.00 or $4.91 per acre and the value at the mill or market was $604.00, or $15.09 per acre. Harvesting of this 40-acre tract approximated 52 man days of labor, or an equivalent of about 3 months work for the farmer, which could mean all of the winter season. If out-of-pocket costs for cutting and delivery are subtracted, the farmer could receive $270 additional for labor in cutting and hauling.

Studies at Crossett have shown that woods work there or at any other place where the same management and cutting practices are followed, is sufficient to provide year-round woods employment to one man for every 150 acres of timber land. The work includes timber marking, cutting, bunching, loading, hauling, and overhead. As the forests are built up to a good stocking, extensive management will provide full-time woods employment for one man for every 125 acres of timber land, or woods and mill employment for one man for every 60 acres of timber land.

Use of Hardwoods In South U. S.

Utilization of hardwood, of which the South is amply provided and closely in conjunction with the southern pine (in lowlands even among the hills), has been a matter of pressing interest to not only the Southern paper industry but also to lumbermen and all other classes or ownership as well.

During the pulping processes 50% or more of the pulp log is usually converted into soluble products. Efforts have been made to use these soluble products which consist of soluble lignin products, the hemicellulose, and extractives. The liquors from the sulfate pulping of southern yellow pine have given yields of tall oil as high as 200 pounds per ton of pulp produced. This tall oil is being marketed in limited amounts for soaps and emulsifiers.

The using of southern hardwoods up to 20% by mixing with Southern pine has been in vogue among the Southern mills for the past period, with gum as the favorite species. It may be anticipated, however that the lead of Southern Kraft Division of International Paper Co. may be followed. At Georgetown, S. C., Southern Kraft is building a pulp mill to use hardwoods exclusively.

Far Western Statistics Are Revised For '46

The only area in the United States in which the U. S. Forest Service has available recent official surveys, bringing up-to-date the information on the nation's pulpwood resources, is in the Pacific Northwest.

Periodic surveys in Washington, Oregon, Northern Idaho and Western Montana have been special features of PULP & PAPER INDUSTRY'S Review Number each year. We are pleased to be able to present this information again in this issue —brought up-to-date by the regional Forest & Range Experimental Station officials.

However, it should be noted that the accompanying tables do not include Douglas fir, of which there is about 65 billion bd. ft. in the region. Each year, the Forest Service has left this species out in the preparation of the table for this magazine, because Douglas fir has been —and still is—the dominant lumber species.

But it is rapidly becoming a spe-

Volume of Pulpwoods, Other Than Douglas Fir, in Western Washington and Western Oregon Available for Cutting, by County (In thousands of cubic feet)

WASHINGTON

County—	1936	1944	1945	1946
Clallam	3,732,187	2,741,000	2,672,000	2,641,000
Clark	34,248	33,000	32,000	32,000
Cowlitz	972,384	881,000	870,000	860,000
Grays Harbor	2,902,400	2,567,000	2,481,000	2,452,000
Island	8,934	9,000	9,000	9,000
Jefferson	3,456,382	2,237,000	2,215,000	2,204,000
King	2,166,924	2,051,000	2,131,000	2,109,000
Kitsap	23,295	19,000	19,000	18,000
Lewis	2,423,835	2,067,000	2,028,000	1,997,000
Mason	465,119	334,000	331,000	329,000
Pacific	1,908,220	1,832,000	1,753,000	1,727,000
Pierce	1,358,908	1,187,000	1,148,000	1,127,000
San Juan	11,461	11,000	11,000	11,000
Skagit	1,836,559	1,699,000	1,664,000	1,641,000
Skamania	1,825,243	1,831,000	1,845,000	1,837,000
Snohomish	2,266,424	2,176,000	2,159,000	2,148,000
Thurston	53,818	31,000	31,000	31,000
Wahkiakum	508,615	438,000	463,000	454,000
Whatcom	1,006,741	986,000	957,000	940,000
Total	26,961,697	23,130,000	22,819,000	22,567,000

OREGON

County—	1936	1944	1945	1946
Benton	58,273	34,000	33,000	32,000
Clackamas	1,141,042	1,087,000	1,241,000	2,215,000
Clatsop	1,089,450	1,163,000	1,131,000	1,110,000
Columbia	48,139	36,000	37,000	37,000
Coos	434,653	310,000	389,000	387,000
Curry	185,953	187,000	192,000	192,000
Douglas	1,635,494	1,548,000	1,570,000	1,552,000
Hood River	424,900	292,000	340,000	340,000
Jackson	961,702	958,000	954,000	950,000
Josephine	110,289	107,000	107,000	107,000
Lane	2,812,664	1,330,000	1,286,000	1,282,000
Lincoln	666,705	471,000	438,000	421,000
Linn	1,465,262	1,417,000	1,251,000	1,225,000
Marion	528,369	505,000	505,000	461,000
Multnomah	227,155	30,000	132,000	133,000
Polk	220,277	163,000	156,000	154,000
Tillamook	984,874	761,000	732,000	709,000
Washington	84,693	42,000	41,000	40,000
Yamhill	22,774	21,000	20,000	20,000
Total	11,859,653	10,462,000	10,555,000	10,366,000

Source: Pacific Northwest Forest & Range Experiment Station. Includes all trees 4 inch and more in diameter, breast high.

The 1945 figures were adjusted for cutting depletion and growth to Jan. 1, 1945 and the 1944 figures were similarly revised to Jan. 1, 1944. Also reckoned in the calculations are shifts of timber areas from reserved-for-cutting to available-for-cutting status. This accounts for the increase in Oregon in 1945 over 1944. The 1936 figures were published in the Review Number of this publication in 1936 and further explanation of those figures will be found in that issue.

cies of value to the pulp and paper industry, as mentioned earlier in this section in a discussion of pulpwood trends. Within a year or two, a tremendous use of fast-growing second growth Douglas fir will take place in the pulp mills, thanks to the new groundwood and kraft and bleaching processes. In some mills it will be the dominant pulpwood species.

This species already comprises 50% of raw material for the western kraft pulp and insulating board mills. Most of this is in shape of slabs from sawmills. Both large log and slab hydraulic barkers, being installed extensively in the West, are increasing the use of this species of wood.

Accompanying tables show the volume in thousands of cubic feet of pulp woods—available for cutting and other than Douglas fir—in Western Washington and Western Oregon have been just recently revised as of January 1, 1946.

These figures are from data prepared by the Pacific Northwest Forest and Range Experiment Station, U. S. Forest Service, Portland, Ore., based on forest surveys started in 1930, and completed in 1933 and 1934. The results were first published in the Review Number of this journal in 1937, and revised in each Review Number since then. References may be made to the 1938 issue for greater detail as to the forest study.

Timber on municipal watersheds state parks, national parks, and primitive areas in national forests, which because of laws or declared public policy is not available for commercial use, was not included.

Since completing the survey the experiment station staff has brought the inventory of the forests of the majority of the counties in the region up to date through field examination.

To date the reinventory has been completed for the following 29 counties: Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom Counties, Washington, and Benton, Clackamas, Clatsop, Columbia, Coos, Lane, Lincoln, Linn, Marion, Polk, Tillamook, Washington and Yamhill Counties, Oregon. The reinventory in Clackamas and Marion Counties, Oregon, will be completed this year.

Volumes have been made current to Jan. 1, 1946, by adjusting the reinventories of the above-named counties and the original inventories for the other counties for depletion through cutting and increment through growth.

The cubic foot volume estimates give the total sound wood content of the stem of the tree, exclusive of bark and limb wood. Decayed material is omitted, as well as the entire volume of all cull logs having more than two-thirds of the board foot content defective. No deduction was made for breakage in logging.

The ratio of timber in the various ownership classes remains about the same as in previous years.

Approximately 45% is privately owned; 43% on national forest lands, such as county, state, Indian reservations, etc.

Not all of the timber shown in the tables will be available for pulp; considerable volumes of both western hemlock and Sitka spruce are utilized annually for lumber. In 1944, more than 600 million board feet of western hemlock logs and 300 million board feet of Sitka

Volume In Thousand Cubic Feet[1] of Pulpwood Other Than Douglas Fir In Western Washington and Western Oregon, Available for Cutting,[2] by Species Groups[3]

Adjusted to January 1, 1946

Species—	Western Oregon	Western Washington	Total
Western hemlock	5,304,000	14,967,000	20,271,000
Sitka spruce	730,000	1,074,000	1,804,000
Balsam firs[4]	3,456,000	6,085,000	9,541,000
Mountain hemlock and Engelman spruce	804,000	313,000	1,117,000
Black cottonwood	72,000	128,000	200,000
Totals	10,366,000	22,567,000	32,933,000

Adjusted to January 1, 1945

Species—	Western Oregon	Western Washington	Total
Western hemlock	5,405,000	15,172,000	20,577,000
Sitka spruce	773,000	1,107,000	1,880,000
Balsam firs[4]	3,501,000	6,099,000	9,600,000
Mountain hemlock & Engelmann spruce	804,000	313,000	1,117,000
Black cottonwood	72,000	128,000	200,000
Total	10,555,000	22,819,000	33,374,000

Adjusted to January 1, 1944

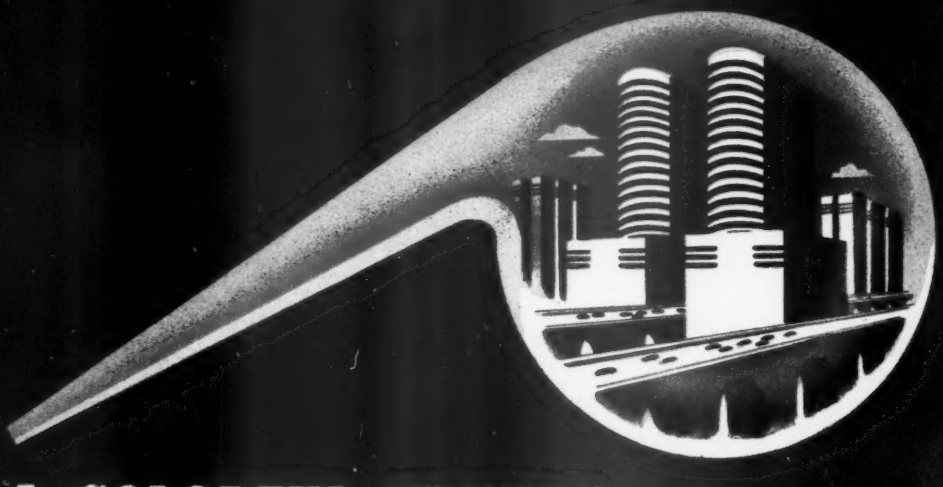
Species—	Western Oregon	Western Washington	Total
Western hemlock	5,413,000	15,525,000	20,938,000
Sitka spruce	748,000	1,153,000	1,901,000
Balsam firs[4]	3,425,000	6,011,000	9,436,000
Mt. hemlock, Engelmann spruce	804,000	313,000	1,117,000
Black cottonwood	72,000	128,000	200,000
Total	10,462,000	23,130,000	33,592,000

[1]Includes all trees 4 inches and more, diameter breast high.
[2]Excludes timber reserved from cutting in municipal, state and federal ownership.
[3]Compiled by Pacilc Northwest Forest and Range Experiment Station from Forest Survey data adjusted for cutting depletion and growth.
[4]Includes Pacific silver fir, grand fir, noble fir, Shasta red fir, white fir, and alpine fir.

1936 — For All Ownerships

Species—	Western Oregon	Western Washington	Total
Western Hemlock	6,439,886	18,654,070	25,093,956
Sitka Spruce	1,145,377	1,625,924	2,771,301
Engelmann Spruce	46,643	9,259	55,902
White Fir	1,652,378	314,023	1,966,401
Amabilis Fir	763,712	6,567,606	7,331,318
Noble Fir	1,338,837	614,175	1,953,012
Alpine Fir	24,675	37,234	61,909
Mountain Hemlock	931,527	372,386	1,303,913
Total	12,343,035	28,194,677	40,537,712

Note—Other tables on this page for later years exclude government-owned reserves.



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Du Pont Dyestuffs

DU PONT DYESTUFFS

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

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spruce logs, cut in the Douglas-fir region, were manufactured into lumber. However, it has been estimated that a total of nearly one-half million cords of slabs, edgings, and trimmings from sawmills is used for pulp annually.

The table on Inland Empire pulpwood — for eastern Washington, northern Idaho and western Montana—was supplied by the Rocky Mountain Forest & Range Experiment Station in Missoula, Mont.

It is pertinent to note that one company, the Inland Empire Paper Co., Spokane, Wash., takes about 50,000 to 60,000 cords annually from Northern Idaho.

A second mill is now planned for the area, to be built in Western Montana, perhaps this year. As for pulpwood from Idaho and Montana taken by Lake States operators, all of the activities have been confined to those adjacent to the Great Northern Railroad between Eureka and the Continental Divide.

The use of farmers' cordwood is a trend in the Far West which is increasingly interesting operators. The installation of hydraulic barking machines is making this an economic source of wood. Slab hydraulic barkers are now in operation in three Puget Sound mills.

INLAND EMPIRE PULPWOOD* BY SPECIES AND SUBREGION

Data as of Jan. 1, 1945

Subregion†	Engelmann Spruce	Hemlock	Balsam firs	Cottonwood and aspen	Total
	Million Cubic Feet				
Northeastern Washington	32	41	53	4	130
North Idaho	608	386	1,697	10	2,701
Western Montana	828	54	242	53	1,177
Total	1,468	481	1,992	67	4,008

*The sound volume inside bark of trees larger than 5.0 inches d.b.h. from stump to 4- to 6-inch top diameter.

†Northeastern Washington consists of Ferry, Pend Oreille, Spokane and Stevens Counties; North Idaho is the portion north of the Salmon River; western Montana is the portion west of the Continental Divide.

Revised Data as of Jan. 1, 1943

Northeastern Washington	30	46	70	....	146
North Idaho	603	381	1,722	10	2,716
Western Montana	827	54	235	42	1,158
Total	1,460	481	2,027	52	4,020

Source—Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Montana.

EXPORTS OF PULPWOOD SPECIES FROM BRITISH COLUMBIA TO U. S.

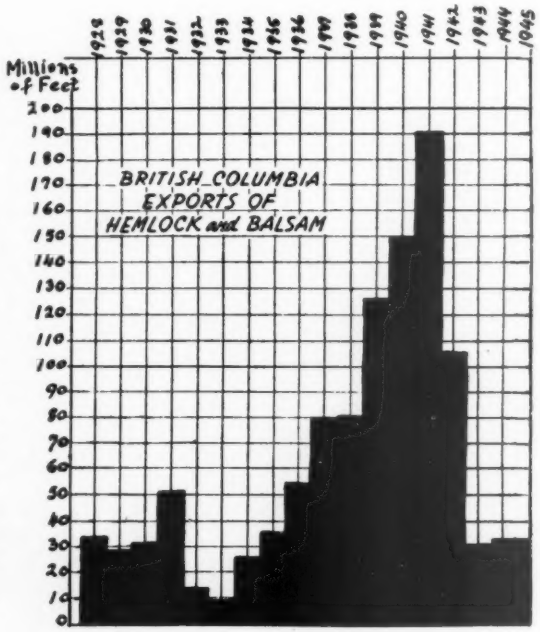
(All Washington State Mills)

In F.B.M. — About 500 F.B.M. to One Cord

Year—	Total	Hemlock	Balsam
1941	191,532,734	153,284,101	38,248,633
1942	106,793,550	88,758,672	18,034,878
1943	29,723,223	25,018,342	4,243,412
1944	32,027,805	26,554,456	5,473,349
1945	32,624,170	28,769,826	3,854,344

HOW CANADIAN PULPWOOD EXPORTS to American mills on the Pacific Coast have fallen off since a limited Canadian embargo was imposed in 1942 is shown here.

Some American mills on Puget Sound argue they were located in that area on the assumption that they could get part of their raw material from B.C. But manpower shortages and demand for hemlock for lumber cut heavily in Canadian production of pulpwood. The Canadian Timber Control permitted export of only 30 million bd. ft. in 1943 and 32,500,000 bd. ft. in 1944. (About 60,000 cords in 1943 and 65,000 cords in 1944). In 1945, exports totaled 32,624,170 bd. ft.



Tree Farms Pass 11,000,000 Acre Mark

Tree farms have passed the 11 million acre mark, only four years after the program was inaugurated with the dedication of the Clemons Tree Farm, near Montesano, Wash. The movement is sponsored by forest industries to aid in perpetuating the nation's forest wealth.

The country now has 945 tree farms with an area of 11,134,950.09 acres. Of this the South is credited with 6,868,402 acres on 807 tree farms. Alabama leads the South with 303 tree farms to her credit. Arkansas with 257, is second and Mississippi, who made a gain of 287 per cent over last year, is third with 143 tree farms. Other states represented in the tally are Texas, 90, and North Carolina with 14. Florida, South Carolina, Tennessee, Maryland, West Virginia and New Jersey joined the program last year.

In the West, which has 138 tree farms totaling 4,266,547.32 acres, Washington is first with 41 tree farms, Montana and Idaho are tied for second place with 24 each, Oregon has 23 and California 21. Wisconsin joined the movement last year.

HARVESTING of Weyerhaeuser timber provides a continuous supply of pulpwood for West Coast Bleached Sulphite Pulp manufactured by the Pulp Division, Weyerhaeuser Timber Company

WEYERHAEUSER

Pulp and paper find increasing uses in molds, laminates and as cellulosic material. Here are production figures and predictions.

A large number of pulp and paper companies are actively interesting themselves in the growing field of plastic or resin-treated products. Some are manufacturing such products, using their paper or pulp supply as raw material, and have organized plastics divisions of their companies. This trend has increased in the past year and shows signs of continuing, especially since certain war-time critical items have become more readily available.

There is also another large plastics field in which companies outside of this industry buy substantial quantities of cellulose or paper which they use as basic material for their own plastics products.

The plastics field is difficult to define. Actually, rayon, cellophane, lacquers, photographic film, and use of alcohol, now the product of two big North American sulfite mills (ethyl alcohol) and also of a sulfate mill in the South (wood alcohol and acetic acid) may be technically embraced in the magic word —plastics.

In seeking information on the various fields of plastic production, PULP & PAPER INDUSTRY addressed itself to the U. S. Department of Commerce. This reply was received from the chemical section of the department's industry division:

"There are no available data on paper laminates and molds used in the plastics industry, nor is it known how much wood pulp is consumed in the manufacture of cellulose plastics." (However, war-time figures of the WPB were obtained and also estimates available from pulp marketers. Also, in lieu of official figures on laminates and molds, we publish in this section a small chart which shows estimated production of the past several years. This was prepared especially for PULP & PAPER INDUSTRY by A. J. Norton, of Seattle.)

In June of 1945, the Bureau of Census, Department of Commerce, began compiling a series of monthly releases on shipments and consumption of plastics and synthetic resins in the United States, and this table was available. It is published with this article. We publish this table, from the first month to the last one received. (Refer to page 132.) This information as it relates to cellulose plastics products differs slightly from that in previous reports of Department of Commerce, which are also published for the period 1942-1944. These are approximately comparable, as explained in connection with the two tables.

Wood Pulp in Plastics

Before the U. S. Pulp Allocations office of the War Production Board closed its doors, there was available information on the authorized consumption of wood pulp for non-paper products. This is how the pulp was being used in the first quarter of 1945 (and these figures did not vary greatly in each quarter during the last two years of the war):

Pulp Consumed
(In Tons)

Cellophane	14,100
Rayon	76,276
Plastics	2,747
Molded pulp products	8,038
Sausage casings, sponges, paint, lacquers, etc.	8,538
Total	109,699

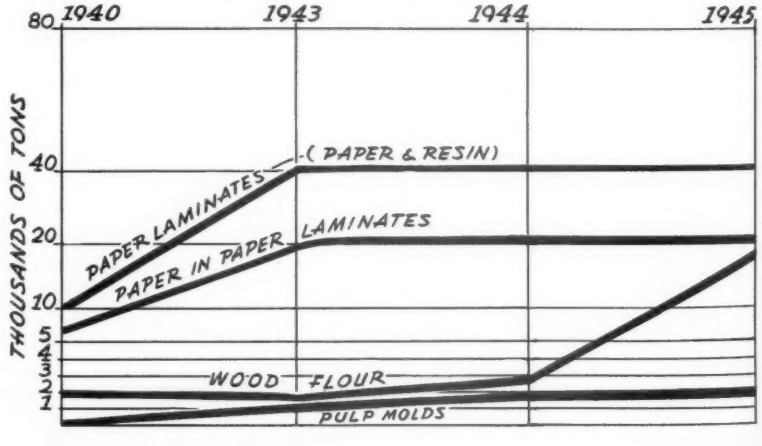
These pulp uses may all be defined as plastics, in the broad use of the term. The term "plastics" as used in the table is the narrow one and defines certain so-called cellulose plastics.

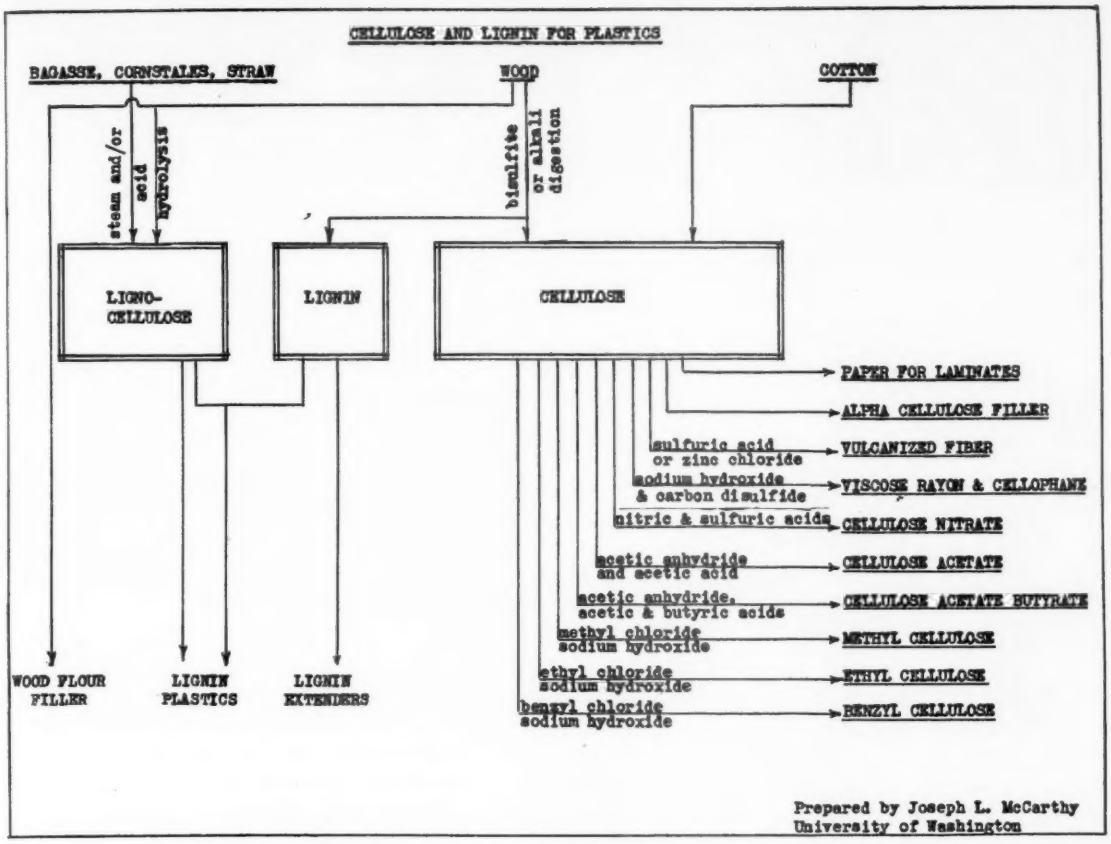
This table, of course, does not indicate the wide use of paper in plastics. Paper laminates alone, Mr. Norton estimates at 40,000 tons in 1945 and he says it was held down by restrictions on material.

Paper and pulp also are used as overlays for plywood and this is becoming an increasingly important field, as the giant peeler logs necessary for plywood become scarce. Furthermore, it is now well established that a stronger, more attractive and more satisfactory plywood results from using paper or pulp resin-treated surfaces for the veneers. Estimates by authorities as to the amount of paper and pulp used for this purpose range from 10,000 to 33,000 tons per year. The Douglas Fir Plywood Association is setting

U. S. LAMINATES AND MOLDS PRODUCTION

According to estimates by A. J. Norton, consultant who has been closely associated with plastics and paper industries in New England and the Pacific Coast, the production of paper laminates has remained at about the same level since 1943—40,000 tons—because of restrictions on materials. About half the tonnage is paper and the other half resin.
Use of phenolic molding compounds with wood flour filler made a big jump to about 19,000 tons in 1945, he said, due to a switch to general purpose molding from the war uses which required extra strength fillers such as cotton flock and cord.
Pulp molds remained steady in 1945 after rising from practically zero in 1940, said Mr. Norton.





THE ABOVE CHART WAS PREPARED ESPECIALLY FOR THIS MAGAZINE

up standards for this overlay industry.

Rex Vincent of Bulkley, Dunton Pulp Co., in a review published in the March issue of PULP & PAPER INDUSTRY, said pulp usage for nitrocellulose would probably soon be about 35,000 tons annually.

Wood pulp as filler for resins, medical absorbents, sanitary napkins, acetate molding powers, methyl and ethyl cellulose, etc., would total an additional 70,000 tons.

Cellophane consumption (about 60,000 tons a year according to the table published above) would reach 90,000 tons under present expansion plans of producers. This would almost equal pulp consumption for glassine and greaseproof papers (yes, the plastics enthusiast, no doubt, will say they are plastics, too).

Removed from the field of pulp users in another plastics were the war-time arsenals. When peace came, they were converting wood pulp into smokeless powder at the rate of 240,000 tons of pulp per

(Continued on Page 134)

CELLULOSE ESTERS AND ETHERS USED IN PLASTICS MOLDING INDUSTRY

Ethylcellulose	
Ethocel	Dow Chemical Co., Midland, Mich.
Dow 2.310	Dow Chemical Co., Midland, Mich.
Lumarith E. C.	Celanese Corp., New York.
Nixon E. C.	Nixon Nitration Works, Nixon, N. J.
Hercules E. C.	Hercules Powder Co., Wilmington, Del.
Cellulose acetate	
Bakelite	Bakelite Corporation, New York, N. Y.
Chemaco	Chemaco Corporation, Berkeley Heights, N. J.
Herculoid	Hercules Powder Co., Wilmington, Del.
Fibestos	Monsanto Chemical Co., Springfield, Mass.
Kodapak	Eastman Kodak Inc., Rochester, N. Y.
Lumarith	Celanese Celluloid Corporation, New York
Nixonite	Nixon Nitration Works, Nixon, N. J.
Plastacele	E. I. du Pont de Nemours & Co., Inc.
Tenite I	Tennessee Eastman Corporation, Kingsport, Tenn.
Cellulose acetate butyrate	
Tenite II	Tennessee Eastman Corporation, Kingsport, Tenn.
Cellulose nitrate	
Celluloid	Celanese Celluloid Corporation, New York, N. Y.
Hercules C. N.	Hercules Powder Co., Wilmington, Del.
Kodaloid	Eastman Kodak Inc.
Nitron	Monsanto Chemical Co., Springfield, Mass.
Nixonoid	Nixon Nitration Works, Nixon, N. J.
Pyralin	E. I. du Pont de Nemours & Co., Inc.
Methylcellulose	
Methocel	Dow Chemical Co.
Benzylcellulose	
Hercules B. C.	Hercules Powder Co.

THIS SYMBOL

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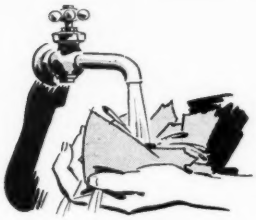
YOUR GUIDE TO IMPROVED PROCESSES AND PRODUCTS



Paracols*...
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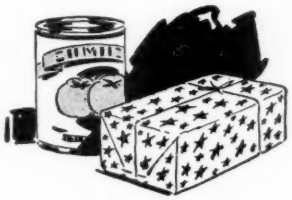
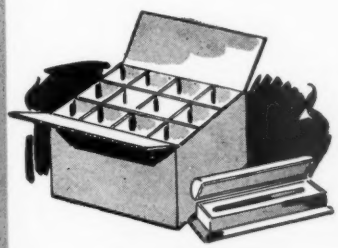
Rosin Size...
Available in dry, paste, and emulsion form. All are characterized by cleanliness, brightness, efficiency.

Casein...
White to pale-yellow in color, granular to fine powder, Hercules casein meets every paper coating requirement.



Nitrocellulose...
Hercules nitrocellulose provides paper lacquers of maximum adhesion, durability, brilliance, and beauty.

Chemical Cotton...
Hercules chemical cotton is a pure cellulose, in loose or sheet form. Cleanliness and brightness are outstanding.



Vinsol* Resin...
A dark-colored resin with a high melting point. Low in cost, it is economical as a stiffener for paperboard.

Back of every Hercules development for the paper industry are Hercules vast research facilities. In this laboratory, extending over 37 acres, more than 600 workers strive constantly to improve materials and finished products. Why not let them help you *on your next problem?*

*Reg. U. S. Pat. Off. by Hercules Powder Company

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CHEMICAL MATERIALS FOR THE PAPER INDUSTRY

U. S. PLASTICS AND SYNTHETIC RESINS—SHIPMENTS AND CONSUMPTION—1945-46

The figures shown represent the quantities shipped and quantities consumed in producing plants. Consumption in this case refers to the quantity of plastics and resins which are manufactured and used by the reporting company or company division, and the shipments data represent the quantities which are shipped by the reporting companies to outside users or to non-producing company divisions or subsidiaries. While the shipments and consumption data are called for separately on the report form, they are combined for the purposes of this report, since in most cases separate statistics on shipments and consumption cannot be shown without disclosing the operations of individual companies.

This table differs somewhat from previous data issued by the U. S. government, as shown in the 1942-1944 table below. But with certain combinations and, as qualified in footnotes, the statistics are approximately comparable with those released for previous years and months.

For example, figures on continuous sheeting (.003 gauge and upward) and "all other" sheets is comparable to the figures shown for cellulose acetate sheets, rods and tubes in reports below for 1942-1944, except that data for a small amount of rods and tubes were formerly included. Since the separate data reported for cellulose acetate rods and tubes cannot be shown without disclosing the operations of individual establishments, they are excluded from these figures.

The statistics for cellulose molding and extrusion material include data for cellulose acetate and cellulose acetate butyrate material. Previously, no data on the consumption for producing companies of molding and extrusion material were collected. Statistics for nitrocellulose products are entirely comparable with those previously issued.

(Monthly totals shown in Pounds — No information available before June

	1945							1946
Cellulose acetate and mixed ester plastics:[1]	*June*	*July*	*August*	*September*	*October*	*November*	*December*	*January*
Sheets:								
Continuous (under .003 gauge)	659,548	645,665	660,802	617,451	513,742	568,082	438,251	591,872
Continuous (.003 gauge and upward)	372,583	303,528	393,273	377,785	588,396	645,274	375,691	524,883
All other sheets, rods and tubes	354,302	345,301	378,190	317,508	430,798	446,904	351,159	447,364
Molding and extrusion materials	5,151,393	5,017,512	5,464,666	5,344,463	6,114,096	6,171,003	5,394,508	6,689,778
Nitrocellulose plastics:								
Sheets	747,340	632,756	862,509	735,514	857,622	899,082	828,232	905,696
Rods and tubes	520,123	471,692	554,189	486,640	567,894	598,550	460,780	608,576
Phenolic and other tar acid resins:								
Laminating (dry basis)	3,558,660	3,218,603	3,043,059	1,717,022	1,918,181	2,141,700	1,928,906	2,298,813
Adhesives (dry basis)	1,017,738	907,375	819,508	511,071	598,289	542,188	587,370	1,070,902
Molding materials[1]	11,387,736	9,742,920	10,001,797	9,949,599	10,855,503	9,613,359	9,355,449	10,739,472
All other (dry basis)[2]	4,548,307	3,677,202	3,334,160	3,006,906	2,997,756	2,334,605	2,817,835	4,415,637
Urea and melamine resins:								
Adhesives (dry basis)	2,970,291	2,683,440	3,035,535	2,227,825	2,221,341	2,424,619	2,167,585	2,650,044
Textile and paper treating (dry basis)	547,061	485,423	551,550	734,133	636,809	465,466	516,983	1,071,084
All other (dry basis)[2]	322,757	367,646	163,796	153,828	71,547	262,124	361,677	235,687
Polystyrene	5,898,006	4,816,761	5,295,476	1,712,417	1,778,879	1,859,561	2,239,477	2,728,623
Vinyl resins:								
Sheeting and film[1]	1,355,902	1,212,117	1,140,662	1,185,090	1,458,855	1,179,795	1,325,870	1,569,044
Textile and paper coating (resin content)	2,122,082	2,041,133	1,813,385	1,366,602	1,491,575	1,102,032	1,058,465	1,650,026
Molding and extrusion materials[1]			3,956,140	2,216,090	4,194,258	4,852,897	4,793,349	5,496,024
Adhesives (resin content)	2,170,949	1,669,263	.....	224,513	278,076	328,992	347,221	399,177
All other (resin content)[2]	.....	.....	1,334,129	665,568	326,437	478,571	525,886	325,491
Miscellaneous plastics and resins:								
Molding and extrusion materials[1 3]	10,569,934	9,032,707	3,731,259	3,067,259	4,188,856	4,110,975	4,194,448	4,647,572
All other (dry basis)[2 4]	3,553,389	3,388,285	2,599,459	2,614,375	2,123,822	1,891,137	1,480,227	2,630,148

Source—Chemicals Unit, Industry Division, U. S. Bureau of Census.
[1]Includes filler, plasticizers and extenders.
[2]Excludes data for protective coating resins.
[3]Includes data for ethyl cellulose, urea and melamine, acrylic acid and miscellaneous molding and extrusion materials.
[4]Includes petroleum resins, acrylic acid ester resins, mixtures and miscellaneous synthetic resin materials.

U. S. CELLULOSE PLASTIC PRODUCTS: PRODUCTION, AND SHIPMENTS AND CONSUMPTION 1942-1944

(In Pounds)

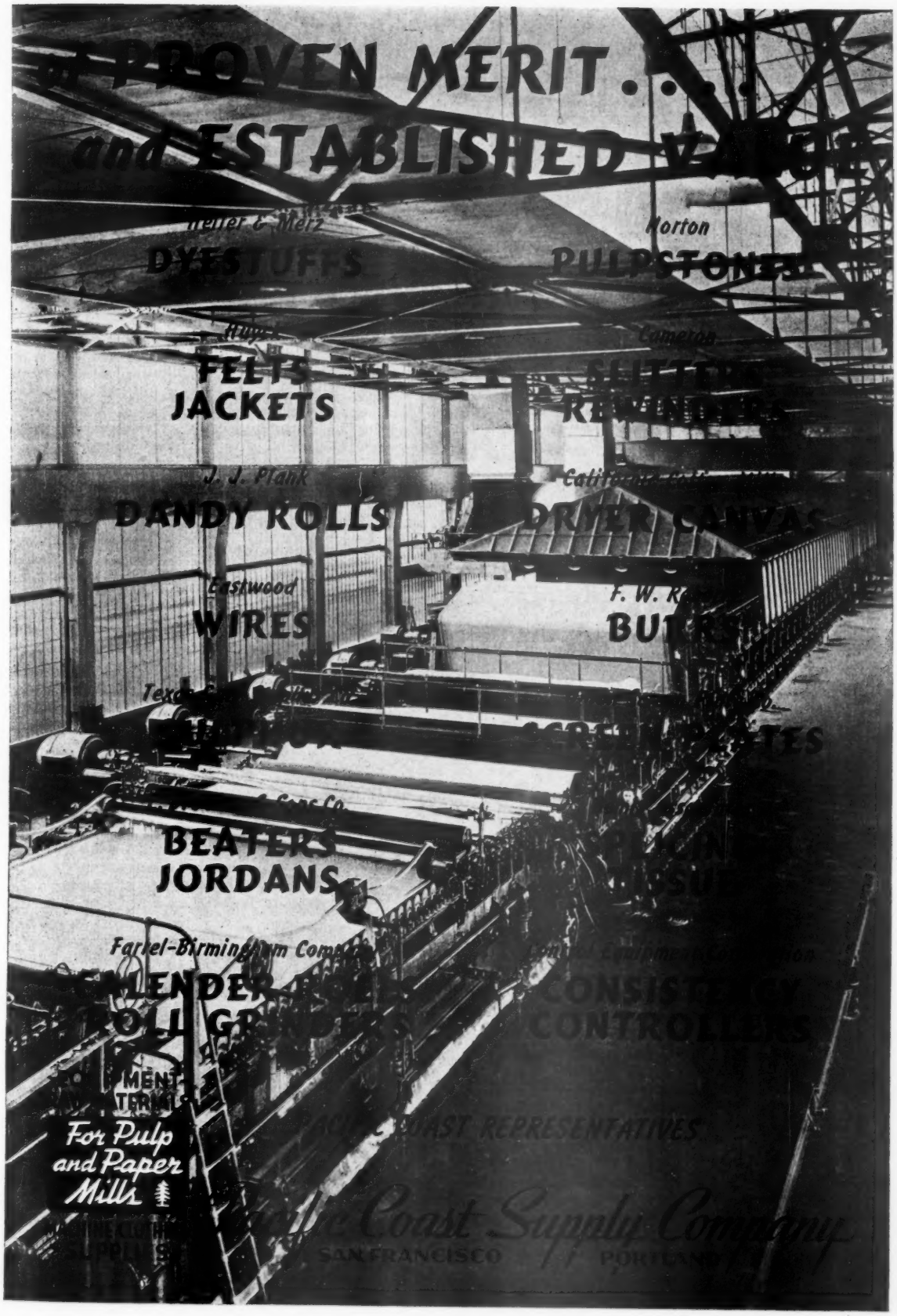
	NITROCELLULOSE								CELLULOSE ACETATE			
	Total		Sheets		Rods		Tubes		Sheets, rods, and tubes		Molding composition	
	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments
1942	15,128,826	16,038,188	10,422,370	10,838,323	3,662,075	3,819,016	1,044,381	1,380,849	7,453,307	6,777,324	40,792,518	38,794,514
1943	14,042,348	14,530,299	8,929,257	9,323,639	4,280,853	4,409,707	832,238	796,953	10,163,467	10,082,236	44,222,714	42,214,571
1944												
January	1,275,119	1,209,993	791,671	770,263	409,823	377,964	73,625	61,766	798,925	838,260	4,040,660	3,705,769
February	1,443,101	1,318,505	920,565	793,903	450,050	472,650	72,486	51,952	721,952	868,261	4,213,788	4,019,165
March	1,468,320	1,479,146	931,996	917,165	459,720	480,003	76,604	81,978	646,137	822,248	4,482,339	3,878,183
April	1,474,637	1,511,507	947,496	951,989	431,395	467,117	95,746	92,401	676,416	622,199	4,878,333	4,544,239
May	1,456,855	1,469,530	882,587	897,395	484,628	483,626	89,640	88,509	762,307	842,301	5,204,868	4,672,882
June	1,468,681	1,561,850	907,405	943,928	448,191	505,433	113,085	112,489	704,136	757,546	4,860,128	4,528,425
July	1,198,118	1,291,518	726,664	774,303	381,927	419,223	89,527	97,992	736,111	675,785	4,517,606	4,207,545
August	1,382,746	1,319,348	894,642	820,133	396,356	410,655	91,748	88,560	730,922	731,818	5,007,831	4,504,670
*8 mo. 1944	11,167,577	11,161,397	7,003,026	6,869,079	3,462,090	3,616,671	702,461	675,647	5,776,906	6,158,418	37,205,553	34,060,878

*Released as of March 2, 1945. For reasons of national security figures for late 1944 months and recent months were withheld.
Source: Bureau of Census.

CELLULOSE PLASTIC PRODUCTS—1942-44

Data above are based on reports of 15 manufacturers which represent practically the entire industry. Nine manufacturers make cellulose nitrate products, six make cellulose acetate products and ten make cellulose acetate molding composition. Beginning October, 1943, data are included for two companies which produce cellulose acetate molding composition from scrap material. While these companies were in operation prior to October, 1943, comparability of the data is little affected; in that month, they made no shipments and accounted for only 2 per cent of total molding composition production. One additional company reported cellulose acetate sheets, rods and tubes for the first time in November, 1943. The production of this company is so small that comparability is unaffected.

The production, and shipments and consumption figures represent data reported by prime manufacturers of cellulose plastic material and include no data for plastic molding which manufacture products from purchased material. This results in some understatement of the data for cellulose acetate sheets, rods and tubes. Manufacture of these products from purchased material, however, is reflected in the data here shown for shipments of cellulose acetate molding composition. The statistics shown for sheet forms do not contain data for safety glass sheeting. They may, however, contain data for some wrapping material, since the report form does not specify that such should be excluded.


PROVEN MERIT . . .
and ESTABLISHED
Heller & Merz
DYESTUFFS
Norton
PULPSTONES
Albany
FELTS
JACKETS
Cameron
J. J. Plank
DANDY ROLLS
Eastwood
WIRES
BEATERS
JORDANS
Farrel-Birmingham Co.
For Pulp
and Paper
Mills
SAN FRANCISCO

PROBABLE MARKETS FOR CELLULOSE, WOOD-FILLED PLASTICS AND LAMINATES

AIRCRAFT
aileron tabs
antenna masks
astrodomes
bulkheads
cold air ducting
control knobs
cowlings
doors
escutcheons
fairings
fairleads
flooring
fuselages
instrument housings
insulation
interior paneling
lights and fixtures
moldings
radar housings
propellers
pulleys
seat frames
trim
windows
window frames
wind screens
wing tips

APPAREL
buckles
buttons
costume jewelry
handbag frames
handbag handles
handbag ornaments
hats
luggage
luggage trim and fittings
millinery ornaments
slide fasteners

ART & GIFTWARES
artificial flowers
ashtrays
bookends
brushes
buttons
candy boxes
cigaret boxes
clothes hangers
combs
compacts
costume jewelry
desk accessories
figurines
fountain pens and sets
jewelry boxes
miniature furniture
mirror frames
paper knives
perfume bottles
picture frames
shoe trees
shoe horns
tie racks
trays
vases

AUTOMOBILES
coils
dashboards
distributors
dome lights
door locks
emblems
fenders
generator base
horn buttons
instrument panels
insulation
knobs
license plate holders
lenses
magnetos
panels
radiator ornaments
seat ends and backs
spark plug caps
steering wheels

BUILDING & CONSTRUCTION
bar fronts
baseboards
bookshelves
built-in cabinets
cornices
floorings
grilles
handrails
hardware
insulation
kick plates
lighting fixtures
moldings
panels
partitions
push plates
skylights
shelves
switch plates
table-tops
toilet seats
utility units
venetian blinds
ventilators
wainscoting
wall surfaces

ELECTRICAL APPLIANCES
bushings
circuit breakers
dials
handles
housings
insulation
knobs
levers
meters
name plates
plugs
spouts
trim
washers

FURNITURE
arm rests
casters
clock housings
counter-tops
desk-tops
drawer fronts
drawer linings
hampers
hatstands
lamps
mirror frames
ornaments
strip moldings
table-tops
trim
veneers

GAMES & TOYS
airplanes
automobiles
balls
billiard balls
boats
chess
checkers
chip racks
construction blocks
cribbage boards
dice
dishes
dolls
dominoes
guns
Mah Jong blocks
marbles
poker chips
puzzles
rattles
shuffleboard disks
toy soldiers
table-tennis paddles
trains
trucks

HARDWARE
cup holders
drawer pulls
faucet handles
grommets
handles
hinges
knobs
moldings
nozzles
sleeves for expansion bolts
screws
tool handles
towel handles
tubing

HOUSEHOLD ITEMS
broom shoulders
clothes pins
compartmented baby dishes
coaster sets
cocktail stirrers
cookie cutters
dust pans
egg timers
funnels
grill plates
graters
ice cube molds
iced tea spoons
measuring cups
measuring spoons
napkin rings
nozzles
salad sets
salt-and-pepper shakers
sing strainers
soap trays
sugar and flour scoops
trays

INDUSTRY
bearings
brackets
brushes
bobbins and shuttles
cams
conduits and pipe
floorings
gaskets
gears
hand wheels
housings
name plates
paints and coatings
seal rings
straining cloths
strippable coatings
tooling
truck wheels
washers

MUSICAL INSTRUMENTS
batons
finger grips
mouthpieces
ocarinas (molded)
piano accordion fabric
piano keys
piano tops
phonograph cabinets
phonograph records
picks for banjos, guitars
recorders or block flutes (molded)
reeds for clarinet, saxophone
trim on drums, banjos
xylophone mallets

PACKAGING
closures
flexible bags
rigid boxes

RADIOS
cabinets
coil forms
condensers
contact strips
dials
insulators
knobs
spacers
switches
terminal blocks
tube bases
tube sockets

RAILROADS & SHIPS
bearings
cabin partitions
floorings
furniture and fixtures
gears
guard rails
instrument panel boards
insulation
lighting fixtures
molded boat hulls
paneling
plywood freight cars
transparent decks
trim
upholstery

SCIENCE & MEDICINE
arch supports
beakers
braces
containers for chemicals
earpieces
eye lenses and frames
funnels
hearing aid cases
instrument cases and housings
instrument handles
oxygen mask and bag
pipe and tubing
prostheses
spoons and stirrers
slide comparators
splints
sterilizer handles and feet
thermometer cases

SPORTS EQUIPMENT
arrow nocks
ammunition kits
baseball caps
bicycle frames and chains
bicycle fender guards
boat trim
boats
diving masks
fishing floats
fly boxes
flashlights
football helmets and guards
hunting knives
fishing leaders
fishing needles
paddles
reel ends and seats
rod handles
skis
surf and paddle boards
swimming paddles
toes

year. It was the raw material for firing all of the army's large and medium guns, and had largely replaced cotton linters for this purpose. In the end Washington state sulfite mills were producing all of the wood pulp for this purpose, although during the war New England sulfite and Southern sulfate mills had a try at it.

Uses Developed in Wartime

Large quantities of cellulose plastics, and glassine and parchment papers were used during the war in packaging, principally for protection of food and equipment against corrosion, rust, mildew, mold, dryness, dampness, and contamination. These successful war uses point to new uses in a new age of peace. For instance, the new industry of frozen food packaging.

An important contribution of these plastic-type papers or cellulose products was in connection with dehydrated and compressed foods, which saved from 25 to 75 per cent of cargo space in marine transport. They afforded effective protection to eggs, meats, fish and similar perishable products. Mois-

(Continued on Page 162)

Producers of

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Large stocks carried at all times, permitting prompt shipments . . . Uniformly high purity of 99½% or better . . . Free of arsenic, selenium and tellurium.

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TEXAS GULF SULPHUR CO. INC.
75 E. 45th Street New York 17, N.Y.
Mine: Newgulf, Texas

U. S.-Canadian rayon industry sets new records. Wood pulp use increases to 297,000 tons, twice as much as in 1939. Rayon tire cord booming.

Rayon—still one of the most rapidly growing industries in the rest of the world, despite declines in the Axis countries—marched on to new all-time records for production and consumption in the United States and Canada in 1945.

And stepping right along with it, the utilization of dissolving wood pulp for U. S. rayon manufacture reached a new all-time record level of 297,000 tons. This is double the quantity used in 1939. Sharp war-time competition of ordnance plants and other industries for the available high alpha content pulp only partially slowed down rayon wood pulp expansion, the increase being just 6% from 1942 to 1945.

When one looks back over the phenomenal gains in use of wood pulp for rayon, a survey that reveals a steep upward climb in most years since 1932, when only 43,000 tons were used, there is reason to wonder just how far this diversion of wood pulp is going. Many paper manufacturers awoke to the disturbing fact (to them) during the war that a lot of other industries are competing with them for wood pulp. In rayon, however, the pulp process is highly specialized and a high-cost investment, so that particular field has tempted but few companies.

However, some pulp marketing experts have advised PULP & PAPER INDUSTRY that they do not expect to see the rise in wood pulp use in rayon taper off until it has hit at least 350,000 tons annually. The 1945 use of 297,000 tons was about 60% of the available dissolving wood pulp in the United States in that year.

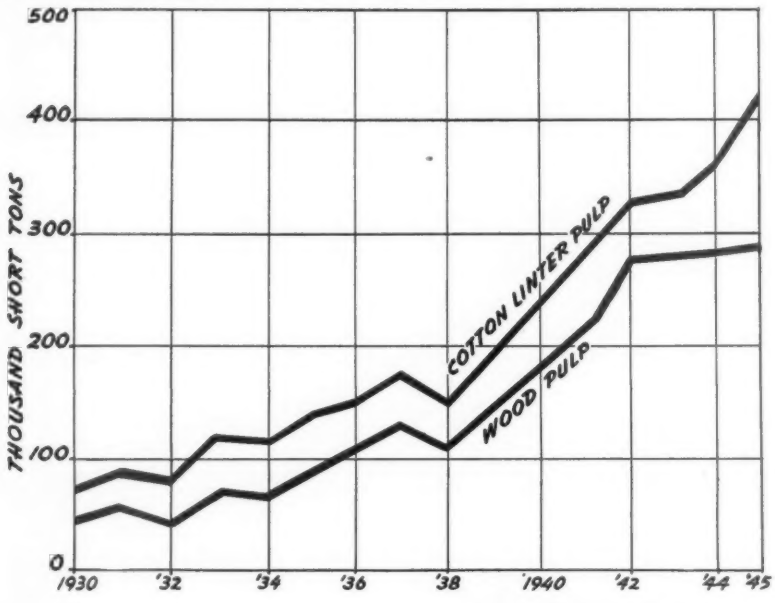
The new high record of U. S. rayon production, according to Rayon Organon (publication of the Textile Economics Bureau, Inc., to whom we are indebted for the statistics in this chapter) was 792,100,000 pounds, an increase of 10% over 1944. Canadian production was 21,000,000, also a record.

But world production fell off from 2,157,000,000 pounds to 1,700,000,000 pounds, according to Rayon Organon estimates.

Viscose rayon yarn production in the U. S. increased sharply—by 17%—due mainly to the increases in use of rayon tire cord for automobile and truck tires.

CELLULOSE CONSUMPTION BY U. S. RAYON INDUSTRY

Showing how wood pulp use has expanded. Cotton linters consumption is only the portion shown between the black lines.



Tall Oil and Rayon Cord

The pulp industry can take a bow on two counts for being an important factor in making a success of synthetic tires—so much so that many rubber industry men agree that the synthetic tire is here to stay. In the first place, the pulp industry has helped to supply the rayon tire cord, which the U. S. Army officially found superior to cotton cord for airplane and army truck tires.

Secondly, the tall oil from Southern pulp and paper mills is of such a character that it has greatly improved synthetic tires. One big rubber manufacturing company states in an advertisement that a better soap from pine (which comes from the big Southern mills) is used "in manufacture of tires which won't heat up and are better than any other synthetics."

Wood Pulp Vs. Cotton Linters

Percentage-wise, the use of wood pulp for rayon did not do as well as cotton linters—its one and only competitor—in 1945, although over a long period of years it has been crowding out the linters. For instance, wood pulp use rose from only 56-57% in 1934 and 1933 to 85 and 84% in 1942 and 1943, but slumped to 74% in 1945, even while tonnage actually reached the new record.

War-time exigencies caused the percentage slump, but with the return to peace-time normality the rayon wood pulp are sure they will leave the cotton linters pulp far behind because of (1) lower and more stable prices for wood pulp, (2) uniformity of fiber and (3) improvements in refining and manufacture of wood pulp.

Beginning in the early '30s, wood pulp began crowding cotton linters out of the viscose rayon field. This is the type of rayon yarn used in the tremendous expansion of rayon

CELLULOSE CONSUMPTION BY THE U. S. RAYON INDUSTRY

Short Tons of Refined Cellulose

	TOTAL PULP		WOOD PULP*		LINTERS PULP*		RAW COTTON LINTERS†
	Tons	Per Cent	Tons	Per Cent	Tons	Per Cent	Bales
1930	72,000	100	45,000	62	27,000	38	115,000
1931	84,000	100	53,000	63	31,000	37	132,000
1932	74,000	100	43,000	58	31,000	42	132,000
1933	115,000	100	65,000	57	50,000	43	213,000
1934	112,000	100	63,000	56	49,000	44	209,000
1935	137,000	100	86,000	63	51,000	37	218,000
1936	151,000	100	104,000	69	47,000	31	201,000
1937	176,000	100	132,000	75	45,000	25	187,000
1938	147,500	100	110,000	75	40,000	25	160,000
1939	194,500	100	145,000	75	53,000	25	211,000
1940	238,000	100	178,000	75	60,000	25	256,000
1941	287,500	100	214,500	75	73,000	25	312,000
1942	330,000	100	280,500	85	49,500	15	211,000
1943	336,500	100	281,000	84	55,500	16	237,000
1944	367,000	100	285,000	78	82,000	22	350,000
1945	400,000	100	297,000	74	103,000	26	438,000

*Wood and linters in purified form as used by rayon producers.

†Bales of raw cotton linters figured on the basis of one-third overweight on refined linters pulp (due to refining losses) and converted to bales on the basis of 625 pounds net weight per bale.

Source: Rayon Organon, April, 1945.

tire cord in the past couple of years. One pioneer in this field, Industrial Rayon Corp., of Cleveland, informed PULP & PAPER INDUSTRY that it uses wood pulp entirely.

According to Rayon Organon:

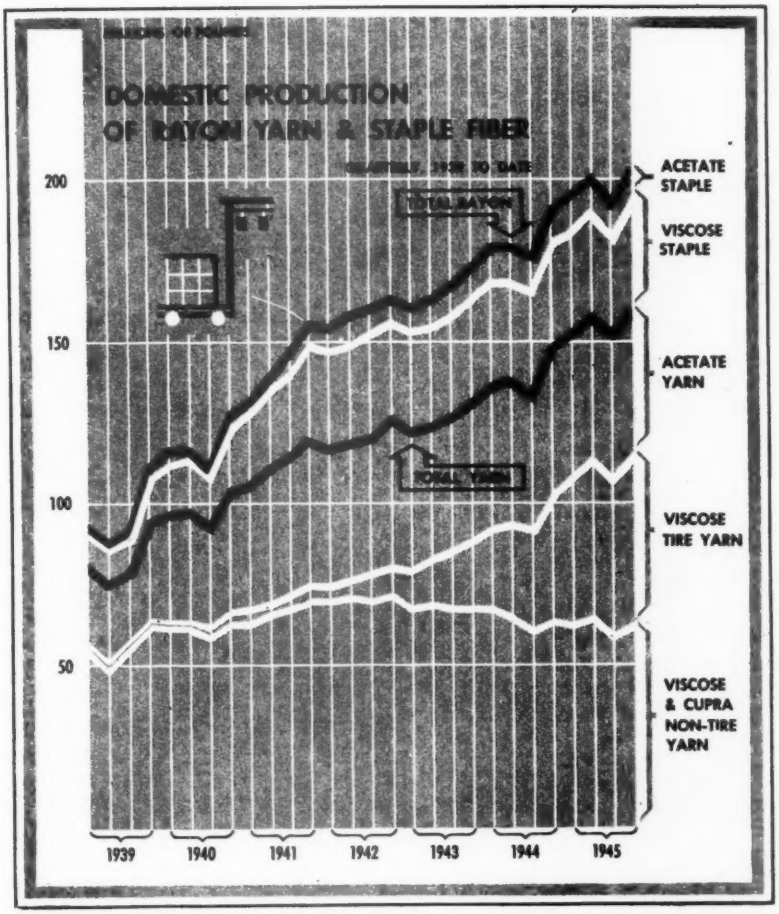
"In the viscose and cuprammonium rayon, the great bulk of the regular tenacity yarn and staple fiber is produced with wood pulp as a base. But in the intermediate and high tenacity (tire cord use) viscose yarns, where production has increased greatly since 1940, industry usage of cellulose varies all the way from 100% linters to 100% wood pulp, with several producers using blends of linters and pulp. For the viscose-cupra yarn and staple fiber as a whole, the cellulose employed is 75% wood pulp and 25% linters."

But it has been in the acetate rayon field in which wood pulp has made the most remarkable advances in war years. Most of this production before the war was with linters. By 1945, 70% of the cellulose used in acetate rayon production was wood pulp. A big future in acetate is forecast by some research authorities.

A pound of finished viscose yarn requires substantially more pulp and a pound of acetate yarn. Viscose yarn is 100% regenerated cellulose, whereas less than two-thirds of the finished acetate rayon is cellulose, the balance being acetyl radical.

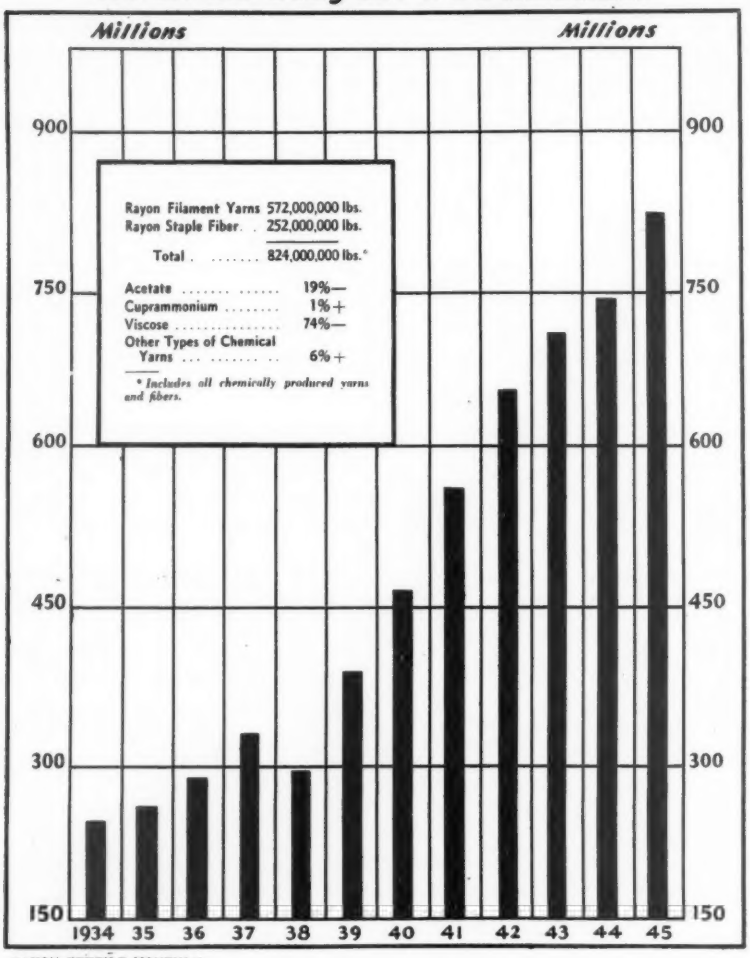
Wood Pulp Prices

Effective Jan. 17, the OPA granted price increases on the sev-



—Reproduced from Rayon Organon.

U. S. A. Rayon Production



RAYON TEXTILE MONTHLY

United States Rayon Production in Millions of Pounds

	1945	1944	1943	1942	1941	1939	1930
Rayon Filament Yarn..	624.1	555.2	501.1	479.3	451.2	328.6	127.3
Rayon Staple Fiber.....	168.0	168.7	162.0	153.3	122.0	51.3	0.4
TOTALS	792.1	723.9	663.1	632.6	573.2	379.9	127.7

United States Rayon Consumption in Millions of Pounds

	1945	1944	1943	1942	1941	1939	1930
Rayon Filament Yarn..	602.4	539.0	494.2	468.8	452.4	362	118
Rayon Staple Fiber.....	164.9	165.7	162.0	151.8	133.6	96.5	1
TOTALS	767.3	704.7	656.2	620.6	586	458.5	119

eral grades of dissolving wood pulp used by the rayon industry. These increases were allowed based on demonstrably higher costs of production.

It is emphasized that these prices represent quotations for the standard grade of wood pulp available at the time. On the other hand, the quality of wood pulp produced has improved over a period of years. This factor should be considered in connection with the changes in prices shown below. There is an analogous price-quality situation in rayon itself, of course.

Rayon Distribution

The 1945 pattern of rayon yarn distribution by principal consuming trades in the U. S. showed the effects of wartime operations and reconversion. As compared with 1944, the 1945 distribution of total rayon yarn shipments to domestic trades showed the following changes: shipments to full-fashioned hosiery —25 per cent, seamless hosiery —13 per cent, circular knitting —2 per cent, warp knitting +7 per cent, broad woven +½ per cent, narrow woven +12 per cent, miscellaneous uses —22 per cent, and shipments to tire manufacturers +62 per cent.

The story of rayon tire cord is one of the really thrilling ones of the war period. In the United States, the viscose+cuprammonium rayon yarn production in the U. S. in 1945 at 448,800,000 pounds represented an increase of 17 per cent over the previous year and was due to the greatly expanded output of high tenacity yarn, the great bulk of which is used to make tire cord and fabric.

An analysis of the rated vs. the "free" uses of rayon yarn during the war and prewar periods reveals the great expansion of the rated high tenacity viscose yarn shipments, mainly for the tire cord program. For example, 195 million pounds of rated high tenacity viscose yarn were shipped by producers during 1945 compared with a 1941 prewar level of 18 million pounds.

Story of Rayon Tire Cord

In a recent issue of Ray-O-Sun, organ of Rayonier mill in Fernandina, Fla., the story of rayon tire cord was told as follows, based on information from Goodyear Tire & Rubber Co.:

"Rayonier, Incorporated, has been manufacturing a pulp at the Fernandina mill for the past few years familiarly known as Rayocord. However, most employees do not realize the dramatic role that this pulp has played during the war so recently ended. Production of this pulp on a large scale was begun when a prominent tire manufacturer discovered experimentally that tires made with a specifically developed rayon yarn gave phenomenal mileage and safety.

"The perfection of the rayon cord tire is the most important development in tire making since the development of the multiple-ply cord tire itself, 33 years ago. This use of rayon almost literally saved our lives. For without rayon, neither America's industry nor America's armies could have kept going. Truck tires—all large tires—made of the only rubber we had, synthetic rubber—burned out prematurely unless they were made with rayon cord.

"The reason for this amazing performance of rayon in tires as compared to cotton cord is that rayon is stronger, created less friction in

The Discovery that Changed the World

For centuries man sought ways to record his thoughts and deeds for posterity. He scratched crude symbols and pictures on the walls of caves. He built obelisks, covered them with carved messages. He wrote on tablets of bronze and clay, on palm leaves, on parchment and on papyrus.

Then about 105 A.D. a Chinese craftsman, T'sai Lun, whipped mulberry bark and other fibres to a pulp, mixed it with water, poured it over grass cloth moulds. The excess water seeped through and left a film of matted fibre. Dried in the sun, then rubbed smooth, the result was paper! Yes, paper made on the same basic principle that we use today! In that dramatic moment when T'sai Lun displayed the first sheet of paper—he revealed a discovery that was destined to change the world.

The dramatic story of paper and its contribution to the advancement of civilization is told in the sound-and-color film, "Paper—Pacemaker of Progress," presented as a tribute to the Paper Industry by F. C. Huyck & Sons on the occasion of its 75th Anniversary.

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ANNUAL FIBER CONSUMPTION IN THE UNITED STATES

(Units are Millions of Pounds and Percent)

	COTTON		WOOL		RAYON		SILK		TOTAL	
	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%
1920	2,828.1	88.9	314.2	9.9	8.7	0.3	29.2	0.9	3,180.2	100
1930	2,610.9	85.0	263.2	8.6	118.8	3.9	75.7	2.5	3,068.6	100
1935	2,754.7	78.9	417.5	11.9	259.0	7.4	62.3	1.8	3,493.5	100
1940	3,953.6	81.0	411.1	8.4	482.0	9.9	35.8	0.7	4,882.5	100
1943	5,258.3	80.4	628.0	9.6	656.2	10.0	nominal		6,542.5	100
1944	4,787.5	78.3	623.9	10.2	704.8	11.5	nominal		6,116.2	100
1945	4,508.2	76.1	648.2	10.9	767.5	13.0	nominal		5,923.9	100

Source: Rayon Organon.

flexing, and therefore generated less heat. Rayon cord conquered heat—a tire's worst enemy.

"Tires made with rayon for passenger cars will be made as soon as government restrictions on rayon are lifted. At present, all rayon is allocated to truck and other heavy-duty tires by government order. Another stumbling block is the limited capacity of the rayon-producing industry. The rayon industry cannot produce enough rayon to fill all demands.

"However, when this new tire is available for passenger cars, here are some of the pleasant surprises in store for you. Because this new tire will run so much cooler, tread-wear will be greatly increased to give you many, many thousands of extra miles. These new tires will roll so smoothly that it will take appreciably less gasoline to run your car. A set of these tires that will last longer than you will want to keep you car is no longer just wishful thinking."

Some new uses for rayon made from wood pulp are going to be surprises for many consumers. Rayon hosiery will be greatly improved and rayon will be used for high strength as well as luxury items.

For several years it has been used in carpets and rugs and an all-rayon faced rug has met with popular acceptance.

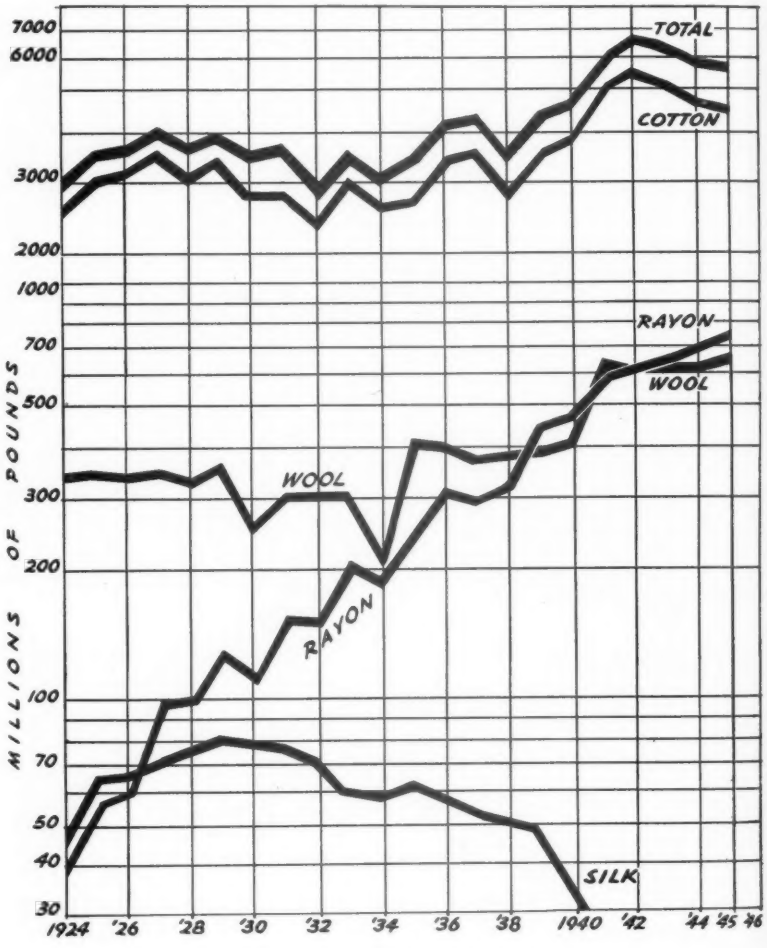
Plant Expansion

Several U. S. rayon producers announced plant expansion programs in the fall of 1945, to be completed in varying periods up to 18 months away. Among these companies were American Viscose Corp., Celanese Corp. of America, Industrial Rayon Corp. and Tennessee Eastman Corp.

The Woonsocket Rayon Div. of the Manville Jenckes Corp. was sold to a new concern, Synthetic Yarns, Inc., as of July first. The Skenandoa Rayon Corp. was sold to Beaunit Mills Oct. 2. In addition, a proposed consolidation of Celanese Corp. of

U. S. FIBER CONSUMPTION

(In Millions of Pounds)



America and Tubize Rayon Corp. was announced in November, to be made effective in early 1946.

The Canadian rayon producing industry also expects to proceed with previously announced expansion programs. Courtaulds (Canada) Ltd. will erect its proposed staple fiber producing plant this year. This plant will have an annual capacity of between 8,000,000 and 10,000,000 pounds of rayon staple fiber. Canadian Celanese Ltd.'s project for the expansion of its facilities at Drummondville to produce an additional 7,000,000 to 8,000,000 pounds of acetate filament yarn and staple fiber per year is progressing; a portion of this program was completed in 1945. Further, according to the Canadian Textile Journal, there are reports that a new viscose rayon

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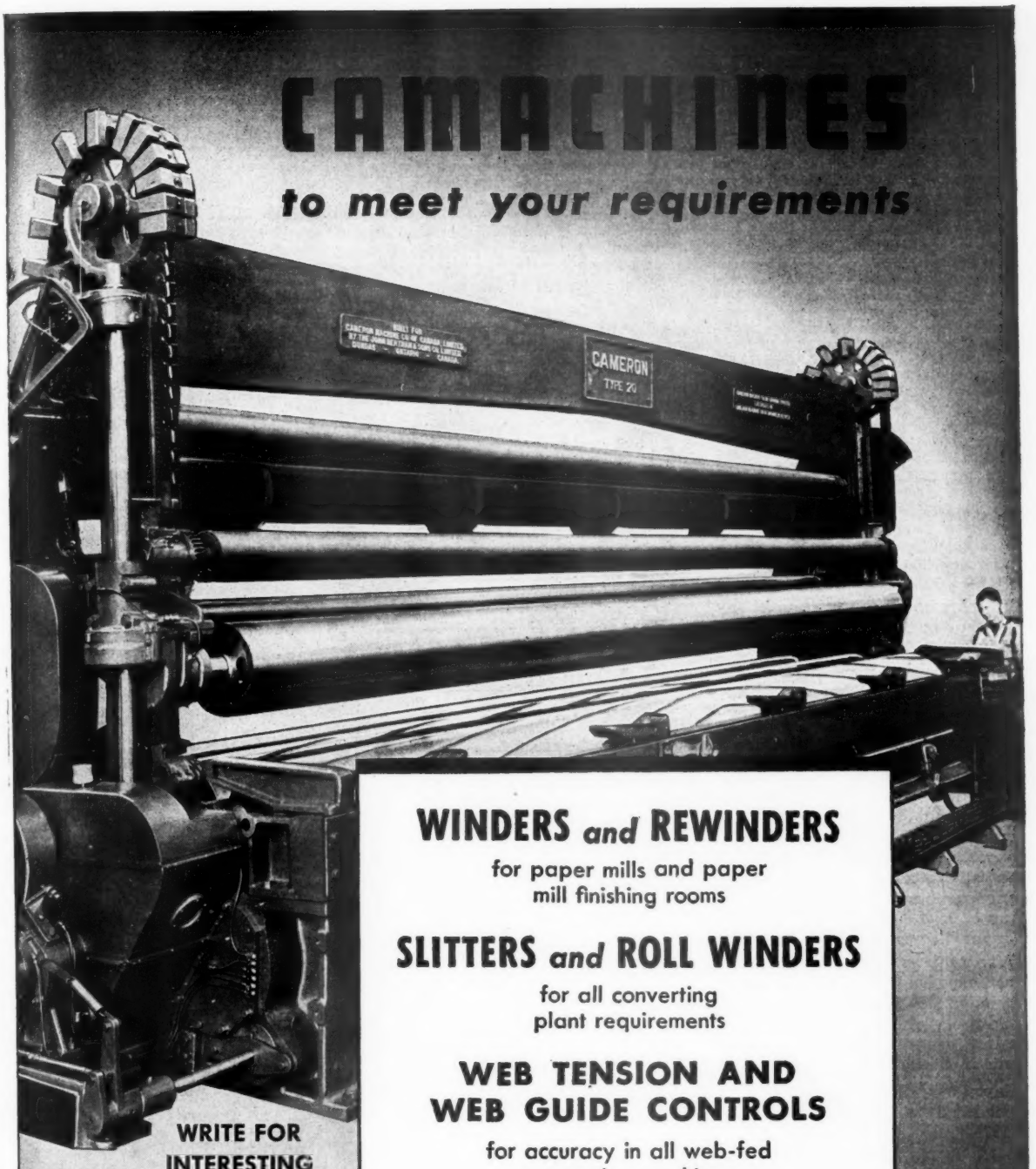

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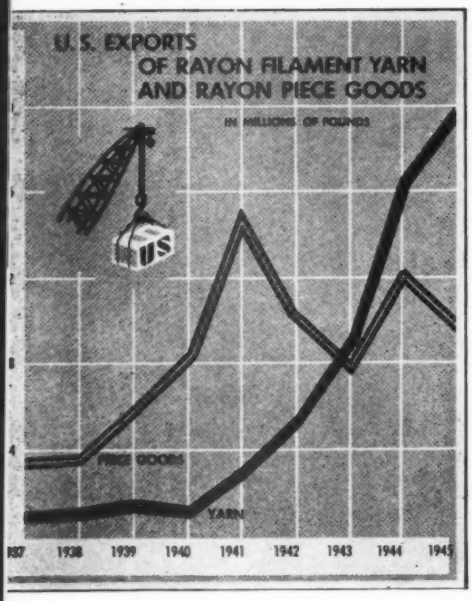

staple fiber and filament yarn plant will be established in the province of Quebec this year by a company organized by Canadian and American interests.

When these expansion plans are completed, the Canadian rayon supply from domestic sources will approximate 38,000,000 pounds annually.

A report on North American expansion in rayon would not be complete without mention of the recent purchase by U. S. Rubber Co. of the government-built rayon processing plant at Scottsville, Va., in order to assure the former a steady supply of up to 2,000,000 pounds per month of rayon tire cord.

Also, important in the wood pulp-rayon expansion pictures, because it may adversely affect the amount of Swedish dissolving pulp available to the U. S. market, are some developments in Sweden.

Rayon manufacturing in Sweden expanded from 1,000 tons production in 1939 to 15,000 tons in 1943. This latter figure represents production of three companies, but since 1943 another new rayon staple fiber mill was started near Karlstad, with capacity of 7,500 tons annually. It is owned by a consumers' cooperative.

World and Canadian Data

Comparison on U. S. and world figures published with this article shows that the U. S. plants made about 60% of the world's rayon filament yarn and about 25% of rayon stable fiber during 1945.

U. S. filament yarn imports for 1945 were zero. Imports of rayon woven fabrics during 1945 were only 297,000 pounds, almost all from Switzerland.

The 1945 rayon staple fiber imports, all in December, were 1,220,000 pounds from Great Britain plus 221,000 pounds from Sweden.

Filament rayon yarn exports for the fourth quarter 1945 totaled 3,711,000 pounds, a substantial decline from exports of 5,924,000 pounds in the third quarter.

According to the Canadian Textile Journal, 1945 rayon consumption in Canada set a new all-time high level of 35,525,748 pounds, an increase of 7% over consumption in the previous year. This figure comprises 21,100,000 pounds of domes-

CANADIAN RAYON PRODUCTION AND IMPORTATIONS

(1925 to 1945—In Pounds)

	Yarn Production	*Yarn Imports*	*Staple Fiber Imports*	*Total Consumption*
1925	507,528	1,851,402	.....	2,359,030
1930	4,627,327	2,383,794	.....	7,011,121
1935	13,215,617	1,214,656	.....	14,430,273
1940	19,637,869	3,482,255	4,180,609	25,574,864
1944	19,225,000	6,969,141	6,975,803	33,169,945
1945	21,100,000	7,584,477	6,841,301	35,525,748

Does not include imports of military tire yarns.

WORLD RAYON PRODUCTION

Thousands of Pounds

	Filament Yarn	Staple Fiber	Total Rayon
1890	30	*	30
1900	2,200	*	2,200
1905	11,100	*	11,100
1910	17,600	*	17,600
1911	18,700	*	18,700
1912	19,800	*	19,800
1913	25,195	*	25,195
1914	19,700	*	19,700
1915	18,500	*	18,500
1916	23,400	*	23,400
1917	24,200	*	24,200
1918	25,900	*	25,900
1919	27,800	*	27,800
1920	33,100	*	33,100
1921	48,200	*	48,200
1922	76,590	*	76,590
1923	102,990	*	102,990
1924	138,285	*	138,285
1925	185,290	*	185,290
1926	211,735	*	211,735
1927	295,095	*	295,095
1928	360,550	*	360,550
1929	434,215	7,185	441,400
1930	451,200	6,250	457,450
1931	499,665	7,980	507,645
1932	517,300	17,285	534,585
1933	663,395	27,895	691,290
1934	772,525	51,835	824,360
1935	941,055	139,575	1,080,630
1936	1,023,305	298,595	1,321,900
1937	1,203,105	620,955	1,824,060
1938	991,475	959,735	1,951,210
1939	1,150,425	1,149,440	2,299,865
1940	1,183,760	1,279,700	2,463,460
1941	1,267,025	1,492,080	2,759,105
1942	1,213,170	1,536,985	2,750,155
1943	1,165,885	1,467,350	2,633,325
1944	1,039,630	1,116,910	2,156,540
1945	1,000,000	700,000	1,700,000

Courtesy: Rayon Oreganon.

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By maintaining constant vigilance in manufacturing and shipping uniformly high quality chemicals, we have endeavored to serve the pulp and paper industry. You can always depend upon Hooker for the quality you want in pulp and paper chemicals.

Another way that Hooker has been helping pulp and paper makers is through the services of its Technical Staff. The close cooperation of Hooker chemists with pulp and paper makers is well known in the industry. The results of this relationship are found in the technical papers and bulletins Hooker has printed and offers to all those interested. These bulletins suggest the way to improved processes, greater economies and higher quality production for you.

They cover many phases of your operations and should be of value to your present operations as well as for your plans for expansion. Some of the Hooker bulletins of interest to the paper industry are listed below. Copies will be sent you when requested on your letterhead.

HOOKER BULLETINS

BULLETIN 201—*Process and Equipment for Making Bleach for Use Without Settling.*

BULLETIN 208—*Prevention of Suck-backs in Chlorine lines.*

BULLETIN 211—*Chemistry of Bleaching Chemical Wood Pulps.*

BULLETIN 234—*Lime-Chlorine System in Preparation of Calcium Hypochlorite.*

BULLETIN 236—*Importance of pH and Catalysts in Bleachery Operations.*

BULLETIN 241—*Bleaching Gumwood Sulfate Pulp.*

BULLETIN 242—*Production and Use of Unsettled Bleach Liquor.*

BULLETIN 243—*Procedures and Brightness Grades in Bleaching Sulfate Pulps.*

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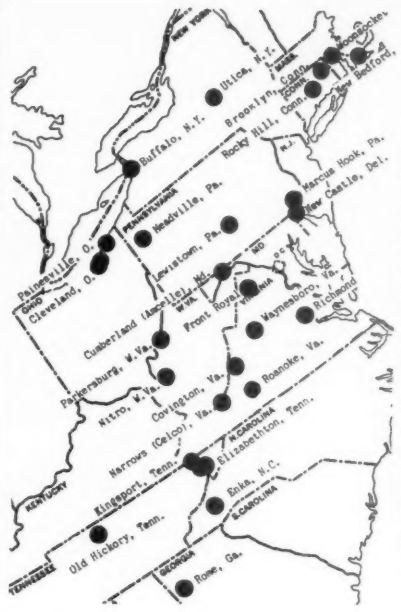
tically produced rayon filament yarn (both textile and tire types), 7,584,447 pounds of imported filament rayon yarns for textile purposes, and 6,841,301 pounds of imported rayon staple fiber. This consumption figure, however, excludes the imports of rayon tire yarns for use in military tires, which aggregated 6,354,531 pounds. If the 1945 consumption figure, as noted above, was properly augmented by the addition of these imports of rayon tire yarn, then the total rayon available for use in Canada during 1945 would approximate 41,900,000 pounds.

Canadian domestic deliveries of both viscose and acetate filament rayon yarn in 1945 exceeded all previous levels. Viscose yarn deliveries increased by 8% over 1944, while acetate yarn deliveries exceeded those of the preceeding year by 11%. However, of the 13,100,000 pounds of domestic viscose filament yarn shipped during 1945, about one half represented rayon tire type yarns for use in military tires.



LOCATIONS OF RAYON PLANTS IN U. S.

Companies, locations and processes:

American Bemberg Corp., Elizabeth, Tenn. (cuprammonium); American Enka Corp., Enka, N. C. (viscose); American Viscose Corp., Front Royal, Va., Lewiston, Pa., Marcus Hook, Pa., Nitro, W. Va., Parkersburg, W. Va., and Roanoke, Va. (viscose), and Meadville, Pa. (acetate); Celanese Corp. of America, Cumberland, Md., and Narrows, Va. (acetate); Delaware Rayon Co., New Castle, Del. (viscose); E. I. du Pont de Nemours & Co., Buffalo, N. Y., Old Hickory, Tenn., and Richmond, Va. (viscose), and Waynesboro, Va. (acetate); Hartford Rayon Corp., Rocky Hill, Conn. (viscose); Industrial Rayon Corp., Cleveland, Painesville, O., and Covington, Va. (viscose); Manville Jenckes Corp., Woonsocket, R. I. (viscose); National Rayon Corp., Cleveland (viscose); New Bedford Rayon Co., New Bedford, Mass. (viscose); North American Rayon Corp., Elizabethton, Tenn. (viscose); Skenandoa Rayon Corp., Utica, N. Y. (viscose); Tennessee Eastman Corp., Kingsport, Tenn. (acetate); Tubize Rayon Corp., Rome, Ga. (viscose and acetate), and U. S. Rayon Corp., Brooklyn, Conn. (cuprammonium).

U. S. PRICES OF DISSOLVING WOOD PULP

Prices are per 2,000 pounds, air dry basis (10% moisture content), freight equalized for gross weight on respective Atlantic Seaboard or Gulf ports.

May 1938	$ 85		
Dec. 1938	80		
Feb. 1939	75		
Apr. 1940	80		$100
Jul. 1940	85	$100	100
Jul. 1943	85	100	110
Apr. 1944	95	100	110
Jan. 1946	107½	112½	117½

Refuses Government

Benn Brothers of London, England, control a large group of industrial publications. Recently they announced that they would not accept any more government advertising, paid or free. The reasons given: shortage of paper and space sorely needed by business concerns.

American rayon pulp has found important export markets in years past, as well as other sulfite pulps. The table below indicates the trend in exports of U. S. pulp before the war.

Celanese Plants In Mexico And U. S. to Use Pulp

The $5,000,000 rayon textile mill of Celanese Corp. of America will be in operation at Guadalajar, Mxico, the middle of 1946, an official of the company told PULP & PAPER INDUSTRY this month. The mill may use either wood fiber or cotton linters, and perhaps both, he said, but would not be committed definitely.

The same company this month acquired a plant at Belvidere, N. J., for the production of plastics and chemicals which will call for the expenditure of $10,000,000 and employ 750. The plant was operated by the New Jersey Powder Co. during the war for the manufacture of smokeless powder.

WOOD PULP: United States Exports to Principal Countries, 1935-39

(Tons of 2,000 pounds)

Year	Total Exports	Belgium	France	United Kingdom	Other European	Canada	Japan	All Other Countries
1935----------	171,710	7,153	7,238	2,877	a/	2,597	135,686	16,159
1936----------	193,485	8,151	5,442	4,337	1,023	1,490	164,705	8,337
1937----------	322,544	14,185	17,415	30,793	3,950	23,798	215,681	16,722
1938----------	140,484	5,197	5,026	31,657	4,488	17,450	61,533	15,133
1939----------	139,504	8,459	8,504	32,587	1,629	21,315	31,251	35,759

a/ Included in "All Other Countries"

Source. United States Bureau of Foreign and Domestic Commerce presented in Wood Pulp Statistics, United States Pulp Producer's Association, July 1944, pp. 67.

GENERAL DYESTUFF CORPORATION

NEW YORK

Newsprint

Canada increases its supply for newspapers of U. S. and overseas. But American mills shift to other grades. Survey of world consumption.

Canada's newsprint industry expects to ship more paper this year than ever before and to supply the United States market with record tonnage.

But meanwhile, in the United States itself the trend is away from newsprint production to book paper and other paper that brings higher return.

Estimates are that Canadian newsprint mills during the first six months of 1946 will make total shipments at an annual rate of 3,696,000 tons and will supply U. S. consumers at an annual rate of 3,000,000 tons. The nearest approach to this figure for U. S. shipments was 2,792,000 tons in 1942. Last year they were only 2,534,000 tons shipped.

Within the past year or so there has been a sharp acceleration of the shift away from newsprint in the U. S., to the evident alarm of many newspaper publishers. But in the editorial pages of these newspapers and on the floor of the Congress, which also has been concerned of late over the newsprint supplies, no voices were ever raised to support a domestic pulp or newsprint industry when the going was toughest in the period of depression.

In the 20 years from 1926 to 1946 United States productive capacity of newsprint has decreased more than 50%, with a reduction of approximately 1,000,000 tons in actual output per year. Manufacturers maintain that this has been brought about by unrestricted competition from newsprint mills elsewhere, imports from Europe at prices considerably under the domestic market, as well as the inability of many United States mills to earn a return on their investment comparable with the profits to be had in other fields.

In 1926 there were 39 U. S. companies producing 1,684,000 tons of newsprint.

By 1942 there were only 17, producing 953,000 tons.

By 1945, only 12 produced 724,000 tons.

This year only eight companies will be in the field but a survey indicates U. S. production may be stepped up to 741,000 tons.

A WPB task group has estimated there will only be five companies in the field in 1948, however, producing only 613,000 tons.

Recent developments may throw a temporary brake on the trend. This magazine recently obtained information that Southern U. S. publishers have definitely decided on a two-machine newsprint plant in a Southeastern state, even if they have to finance it themselves; that the Southlands Paper Mills in Texas has ordered another newsprint machine and that Hearst has purchased the Pejebscot mill in Maine and will change it over to news production.

But mills which have wholly or partially abandoned newsprint production in the past year or so are Crown Zellerbach at West Linn, Ore.; Wisconsin River Paper & Pulp Co., which was Wisconsin's last newsprint mill and is now going to book paper; Maine Seaboard Paper Co., purchased by Time, Inc.; Inland Empire Paper Co.; Blandin Paper Co.; Finch, Pruyn & Co., and Gould Paper Co. Those which have gone into slick book paper for magazines are unlikely to ever return to newsprint.

Low-cost power, fuel, pulpwood and a large capital investment are requisites for a newsprint mill and there are few known locations in the United States where this combina-

U. S. Newsprint Industry's Share Of Domestic Market Continues to Decrease

United States newsprint mills supplied 16½ per cent of the total newsprint available for consumption in the country in 1945 as compared with 18 per cent in 1944, 20 per cent in 1943, 22 per cent in 1942, 25.2 per cent in 1941, 25.9 in 1940, and 26.1 in 1939. In 1939 they produced 76.3 per cent. Correspondingly, supplies from Canada and Newfoundland increased,

Each circle here represents the total amount of newsprint in the United States available for consumption in that year, with percentages supplied from domestic and foreign sources.

tion is available. Montana may be one. But Canada holds all the aces.

Above we have mentioned the decrease in number of producing companies in the U. S. The following table shows the decline in number of actual operations—mills—making newsprint in the U. S., while those in Canada have increased.

U. S. SOURCES OF NEWSPRINT SUPPLY

	U. S. Mills	Canadian Mills	Others
1913	85	15	—
1929	36	57	7
1937	22	68	10
1941	25	70	5
1945 (estimated)	21	74	5
1946 (estimated)	18	77	5

1945 Production

The 4,316,000 tons of newsprint produced in North America in 1945 was 332,000 tons or 8% more than in 1944 and marked a reversal in the downward trend in production which began in 1942. However, it was still 468,000 tons below the 1940-1941 average and 627,000 tons below the peak production year of 1937, according to the News Print Service Bureau, New York.

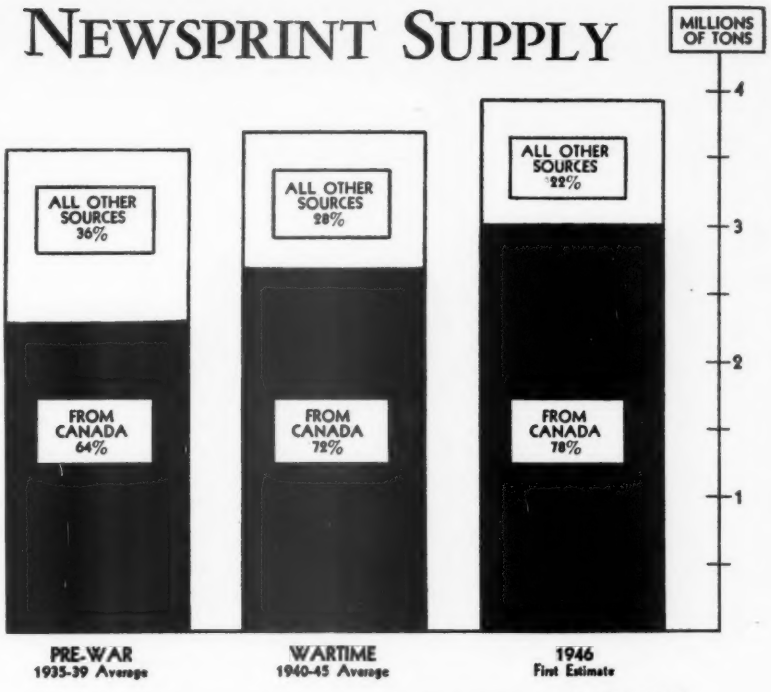
Canada produced 3,259,000 tons or 75½% of the total, the United States output amounted to 724,000 or slightly less than 17%, while the Newfoundland mills turned out 333,000 tons or not quite 8% of the total.

Production in Canada in 1945 was 267,000 tons more than the preceding year—an increase of 9%—but was 167,000 tons or 5% below 1941 and 389,000 tons or 11% less than in 1937. United States production of newsprint was 4,000 tons or not quite 1% more than in 1944. With the exception of that year it was lower than in any year since the beginning of the century. Production in the United States has been decreasing steadily since 1926, and 1945 production was only 43% of that year's total. Newfoundland's output showed an increase of 60,000 tons or 22% more than a year earlier but was still 18,000 tons or 5% below its record production year of 1940.

Shipments from the mills to all destinations were 38,000 tons less than production during the year with the result that mill stocks were higher by that amount than at the end of December, 1944.

The upward trend of 1946 production was shown early this year. Total North American production in February, 1945, was 323,862 tons and shipments were 300,065 tons. North American production in February, 1946, was greater than in any preceding February.

The Canadian mills produced 132,369 tons more in the first two months of 1946 than in the first two months of 1945, an increase of 26.2%. The output in the United States was 8.2% more, and in Newfoundland, 10.8% more. Total increase of 147,810 tons was 21.9% more than in the first two months of 1945.



U.S. TOTAL SUPPLY AND SOURCES: 1935-1946

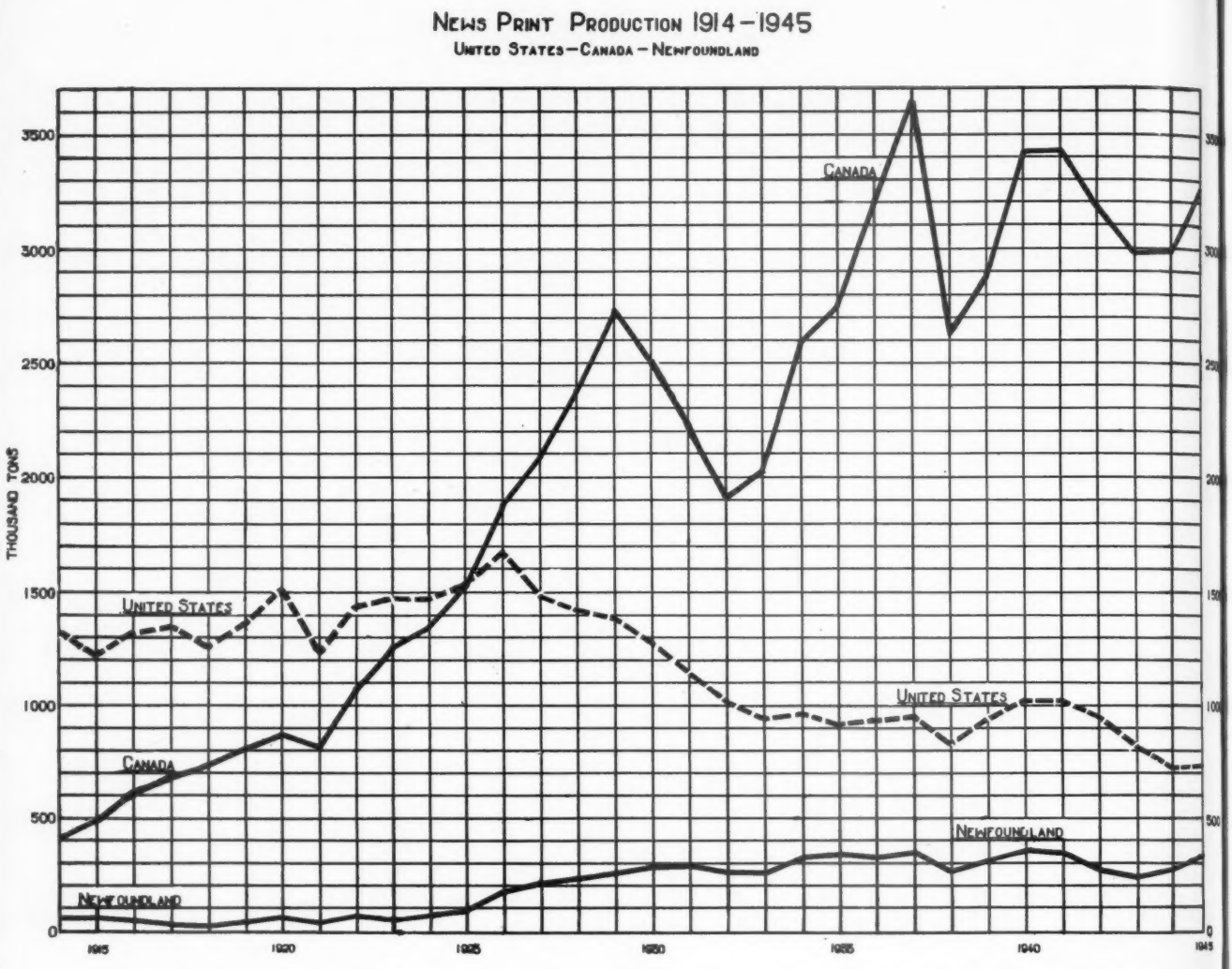
NEWSPRINT EXPORTS FROM CANADA
(Short Tons)

	U. S. A.	Overseas	Total
1945	2,534,000	525,000	3,059,000
1944	2,409,000	391,000	2,800,000
1943	2,545,000	265,000	2,810,000
1942	2,792,000	213,000	3,005,000
1941	2,762,000	500,000	3,262,000
1940	2,586,000	657,000	3,243,000
1939	2,206,000	452,000	2,658,000
1938	1,938,000	486,000	2,424,000
1937	2,899,000	556,000	3,455,000
1936	2,399,000	594,000	2,993,000
1935	2,052,000	523,000	2,575,000
Average	2,466,000	469,000	2,935,000

Exports and Imports

The Dominion Bureau of Statistics reported that exports of newsprint from Canada in 1945 amounted to 3,059,000 tons or an increase of 259,000 tons over 1944. Of this total 2,534,000 tons or 83% went to the United States and 525,000 tons or 17% was shipped overseas. Exports to the United States were 5% more than in 1944 but were 229,000 tons or 8% below 1941. Shipments to overseas' markets were somewhat more than 134,000 tons or 34% greater than in 1944 and were exceeded only in the years 1940, 1937 and 1936.

Imports of newsprint into the United States in 1945, according to official Washington reports, amounted to 2,666,000 tons and were 175,000 tons greater than in 1944. These imports include 2,534,000 tons or 95% from Canada, and 142,000 tons or 5% from Newfoundland. Imports from Canada were 129,000 tons or 5% more than in 1944 while those from Newfoundland showed an in-



crease of 46,000 tons or 48% over the previous year.

There were no imports of newsprint from Europe during 1945 and no important quantities have come from that source since 1939 when imports from that continent amounted to 310,000 tons or 12% of total United States imports in that year.

Overseas Newsprint Exports from North America

(Short Tons)

	1945	1944	Increase %
Canada	525,000	391,000	34
Newfoundland	194,000	170,000	14
United States	18,000	15,000	20
Total	737,000	576,000	28

Stocks

Stocks held by publishers reporting to the A.N.P.A. totaled 266,000 tons on December 31, 1945, and were 76,000 tons below those held a year earlier, and also were lower than at the end of any month since April, 1939.

Stocks of North American manufacturers on the same date amounted to 143,000 tons so that stocks held by these two groups totaled 409,000 tons and were 36,000 tons below those held at the end of December 1944.

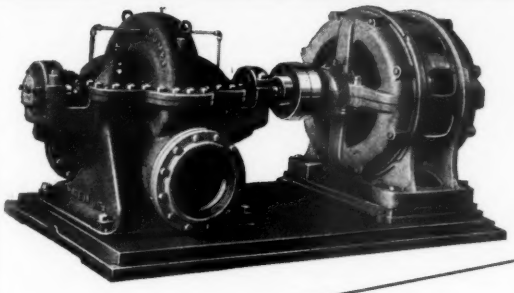
Inventories of publishers are still controlled by the Civilian Production Administration, and the latest order sets the limit at 30 days consumption in the Eastern and Central States and 50 days in the Southern and Western States based on the average daily allowable consumption for the last six months of 1945.

Consumption Worldwide

Estimates of consumption are difficult to make due to the unknown factor of the quantities held by consumers and the changes therein. Government controls over consumption ended Jan. 1 and thereafter nearly all U. S. newspapers were noticeably "fatter."

For 1945, the known factors affecting consumption were U. S. imports of 2,666,000 tons, domestic shipments by U. S. producers totaling 707,000 tons and a decrease in A.N.P.A. publishers' stocks amounting to 76,000 tons or a total of 3,449,000 tons. The current estimate is that A.N.P.A. publishers' consumption represents 71% of total consumption. If the assumption is made that stocks held by other consumers decreased in that ratio a figure of 3,480,000 tons apparent consumption is arrived at. This is 7% more than in 1944.

Consumption of the reporting newspapers in 1945 showed an increase of less than 4½% over 1944. While the percentage is lower than that indicated above, it must be remembered that the smaller publishers were not required to reduce



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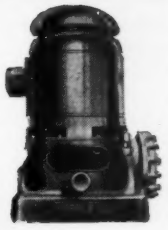

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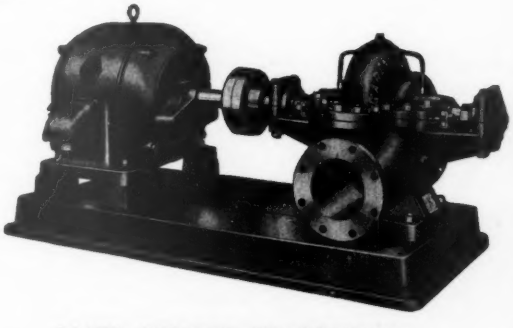

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consumption to the same extent as the large users and there has also been an increase in use by consumers other than in newspapers.

Leading Sunday newspapers in the U. S. averaged 70 pages in size in 1945 or a gain of 2 pages over the 1944 average but were considerably below the average for any year since 1933.

Leading daily newspapers last year averaged 22 pages in size or 1 page below 1944. This was the lowest of any year.

In comparison, reports from London say British newspapers are not hopeful of increasing paper size over six or eight pages this year, but are anxious to get enough newsprint to publish more copies.

At present, Britain's newspapers absorb about 5,000 tons of newsprint weekly—all from the dollar area—and they believedly have about six month's reserves on hand.

In Eire, government control is still being exercised over daily and weekly newspapers.

Recently, because of greater supplies, however, the government has allowed a larger ration of newsprint to dailies which are now running eight-page papers as against those of four pages published throughout the war.

In France, only 27% of prewar newsprint is now available to French newspapers. Before the war the monthly newsprint consumption by French newspapers ranged from 32,000 to 35,000 tons. Now the newsprint committee—an unofficial body—is able to dole out only about 9,500 to 10,000 tons monthly.

In India, permits to import newsprint are being refused or delayed, and in South Africa war-starved newspapers have swallowed increased ration newsprint fed to them since government control suspended early in December and are hungry for more.

Canadian Situation

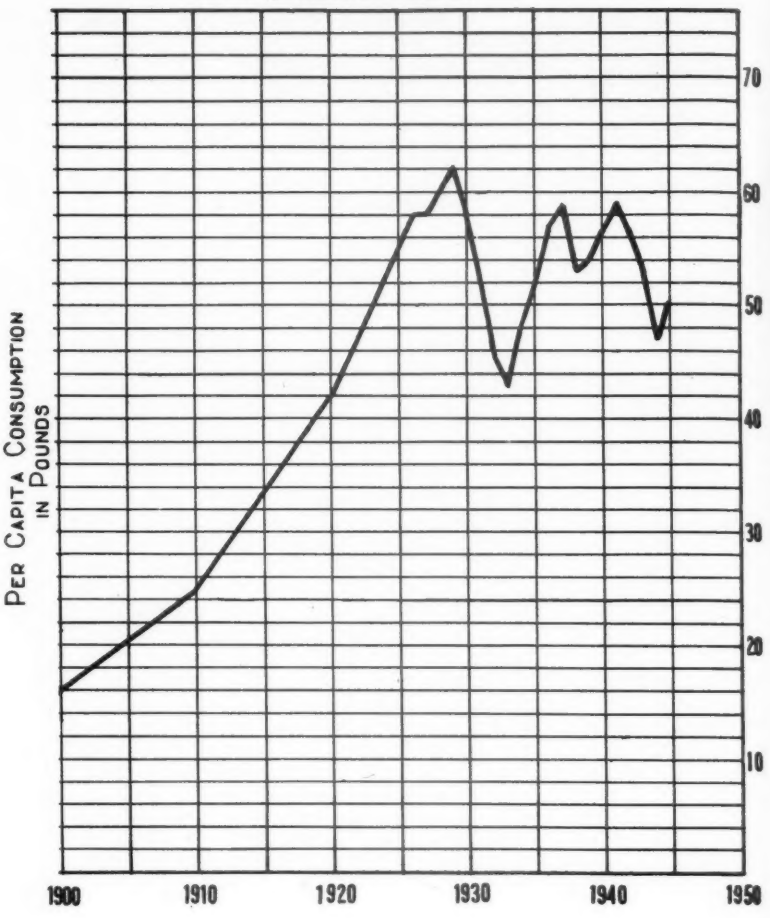
Improvements in the Canadian newsprint situation has been brought about by a slightly better manpower supply resulting in more production in the woods and by operational changes effected in various Canadian mills.

"Although it is estimated that Canadian mills will in 1946 produce 28% more newsprint than in 1939, there are two important factors adversely affecting the supply situation," points out R. M. Fowler, president of the Canadian Pulp and Paper Association and the Newsprint Association of Canada. "One is that there have been some shifts in distribution during the past six years. The other factor is the low level of newsprint stocks the world over."

Customers of Canadian newsprint mills in Canada have received an average of 6% of the total Canadian tonnage through the prewar and wartime periods and will continue to receive the same share this year. Before the war, United States consumers received an average of 76% of total Canadian newsprint output and during the war 81%, due in part to the exclusion of paper from European sources and decline in U. S. production. This year, the United States will continue to receive 81% of the Canadian newsprint production.

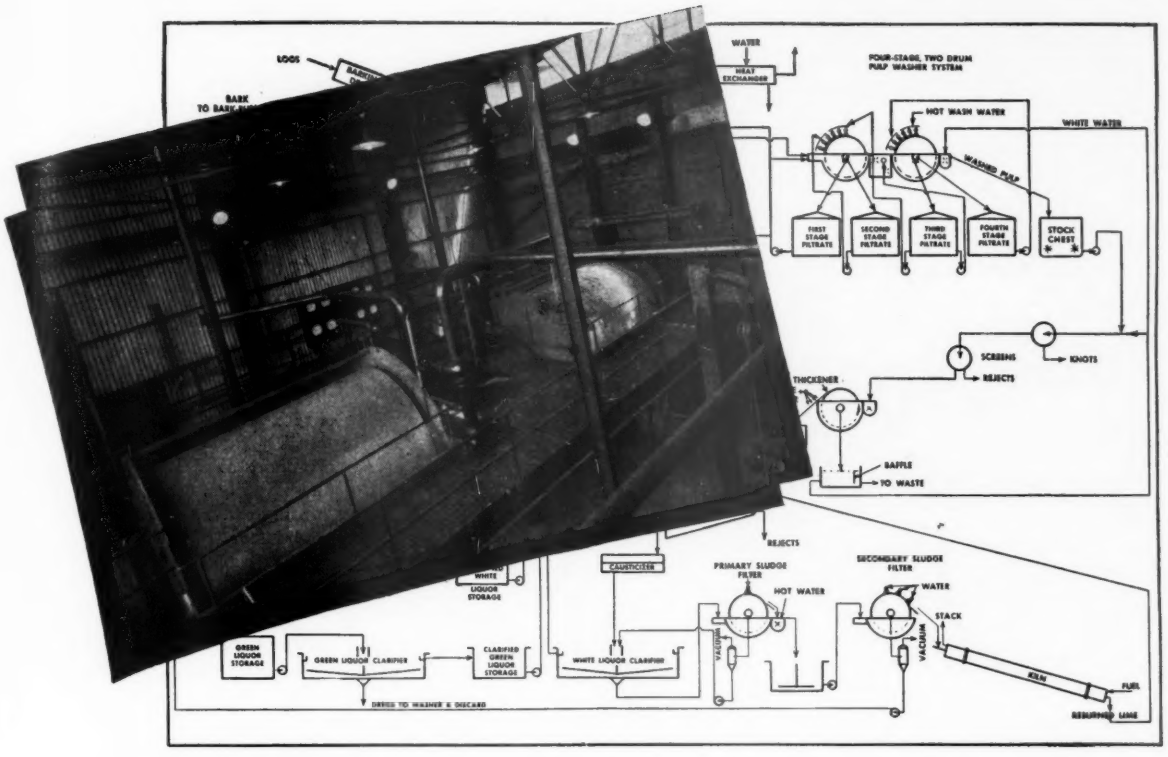
Before the war, Canada's newsprint shipments to all countries other than Canada and the United States accounted for 18% of the

PER CAPITA CONSUMPTION OF NEWS PRINT IN THE UNITED STATES



U. S. CONSUMPTION OF NEWSPRINT

Year—	Population	Newsprint Tons	Paper Used Per Capita
1935	127,521,000	3,300,000	51.7 lbs.
1936	128,429,000	3,650,000	56.8 lbs.
1937	129,257,000	3,830,000	59.3 lbs.
1938	130,215,000	3,458,000	53.1 lbs.
1939	131,878,000	3,550,000	54.1 lbs.
1940	132,817,000	3,730,000	56.2 lbs.
1941	133,923,000	3,930,000	58.7 lbs.
1942	134,633,000	3,800,000	56.4 lbs.
1943	136,497,000	3,650,000	53.5 lbs.
1944	138,101,000	3,250,000	47.1 lbs.
1945	139,621,000	3,480,000	49.8 lbs.



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total production; in wartime they were 13% and they are expected to remain at 13% this year, a decline of 2% from 1945. Curtailment of shipments to countries outside the North American continent was chiefly due to shortage of shipping. This year, shipping services are still somewhat dislocated, but the primary reason for comparatively low level of foreign shipments is the arbitrary restrictions placed on imports because of exchange conditions, the United Kingdom being a notable illustration of this condition. British buyers recently concluded an agreement, however, whereby they would take 50,000 long tons of Canadian and Newfoundland newsprint this year—and this was approved by the British government which, however, stipulated that the remainder of a 224,000 long ton order which had been originally contracted for must be deferred for possible shipment until next year or in 1948.

While no new newsprint equipment is being installed and there seems to be no likelihood of this being done within the foreseeable future, those companies that have the capacity have endeavored to make the most of their facilities.

As an instance of this Captain Arthur A. Schmon, president of Ontario Paper Co. and its subsidiary Quebec North Shore Paper Co., recently announced that newsprint production would be increased 20,000 tons this year as the result of assistance from Beaver Wood Fibre Co., previously concentrating on wallboard.

At the other extremity of Canada, Powell River Co. again had all its newsprint machines in production for the first time in more than two years, and Pacific Mills, Ltd., was carrying out a program to increase groundwood supply. In the central area, Great Lakes Paper Co., at Fort William, was announcing an increase of at least 25% in wood cut this year. Paper mill production there will be close to 100%, compared with 77% in 1945.

"Whether one compare 1946 with 1941 or with some other period," states the Canadian association, "it is important to realize that comparisons of total supply may be different from the actual positions of individual consumers and producers; some consumers and some producers may be more fortunate, or less fortunate, than the average level."

Each instance of an individual consumer faring better than the average means an equivalent instance of another consumer falling below the average. Consequently, with the general shortage of supply which exists, a sure road to acute disorder among United States consumers is to have individuals pursue policies of seeking or taking disproportionate amounts to the disadvantage of other consumers, adds the association's statement.

In the five pre-war years total shipments from Canadian mills averaged 3,003,000 tons a year. In the six war years the average was 3,228,000 tons, an increase of 225,000

SOURCES OF NEWSPRINT USED IN THE UNITED STATES

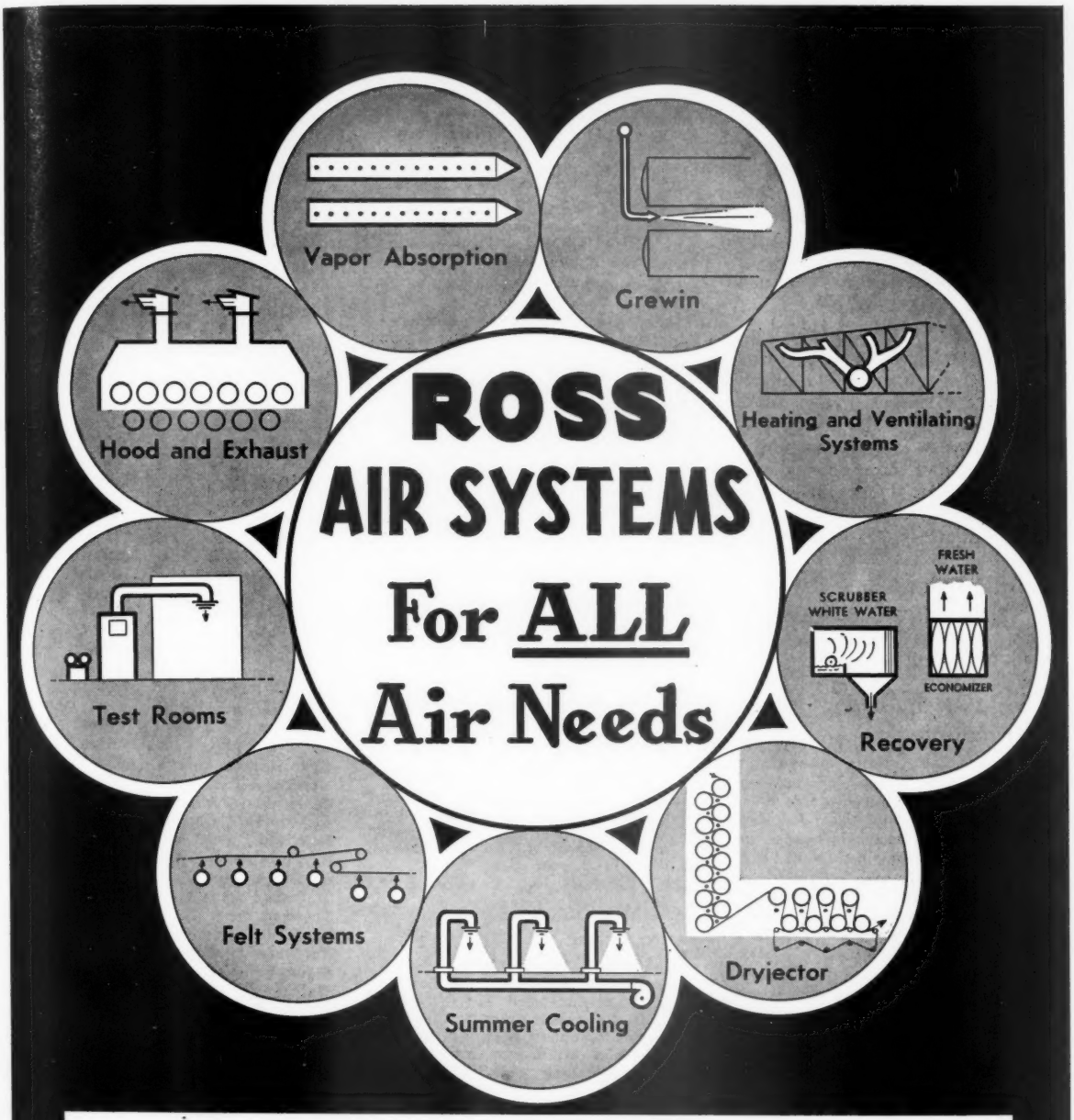
(Tons in Round Numbers)

Source: News Print Service Bureau

	U. S. Production	U. S. Exports	Imports into the U. S. From Canada	Imports into the U. S. From Newfoundland	Imports into the U. S. From Europe	Available for Consumption
1913	1,305,000	43,000	219,000	----------	1,000	1,482,000
1914	1,313,000	61,000	310,000	----------	5,000	1,567,000
1915	1,239,000	55,000	367,000	----------	1,000	1,552,000
1916	1,315,000	76,000	468,000	----------	----------	1,707,000
1917	1,359,000	94,000	558,000	----------	1,000	1,824,000
1918	1,260,000	97,000	596,000	----------	----------	1,759,000
1919	1,375,000	111,000	628,000	----------	3,000	1,895,000
1920	1,512,000	49,000	679,000	1,000	50,000	2,193,000
1921	1,225,000	17,000	657,000	----------	135,000	2,000,000
1922	1,448,000	26,000	896,000	----------	133,000	2,451,000
1923	1,485,000	16,000	1,109,000	----------	200,000	2,778,000
1924	1,481,000	17,000	1,197,000	4,000	156,000	2,821,000
1925	1,530,000	23,000	1,295,000	20,000	133,000	2,955,000
1926	1,684,000	19,000	1,658,000	94,000	100,000	3,517,000
1927	1,486,000	12,000	1,776,000	89,000	122,000	3,461,000
1928	1,418,000	11,000	1,926,000	114,000	116,000	3,563,000
1929	1,392,000	19,000	2,195,000	132,000	96,000	3,796,000
1930	1,282,000	10,000	1,989,000	156,000	134,000	3,551,000
1931	1,157,000	10,000	1,754,000	160,000	151,000	3,212,000
1932	1,009,000	8,000	1,533,000	114,000	144,000	2,793,000
1933	946,000	11,000	1,545,000	95,000	153,000	2,728,000
1934	961,000	23,000	1,956,000	107,000	147,000	3,148,000
1935	912,000	23,000	2,062,000	124,000	197,000	3,272,000
1936	921,000	15,000	2,422,000	87,000	243,000	3,658,000
1937	946,000	17,000	2,899,000	124,000	294,000	4,246,000
1938	820,000	6,000	1,938,000	94,000	243,000	3,089,000
1939	954,259	13,000	2,206,000	104,600	310,000	3,561,859
1940	1,013,000	44,000*	2,586,000	157,000	34,000	3,746,000
1941	1,058,000	73,000*	2,762,000	217,000	3,000	4,015,000
1942	953,000	42,000**	2,900,000**	120,000**	None	3,800,000
1943	805,000	35,000**	2,792,000**	110,000**	None	3,250,000
1944	717,120	40,161**	2,430,000**	100,000**	None	3,650,000
1945	724,000	45,000	2,534,000	142,000	None	3,335,000

*Includes paper which is not standard newsprint. Standard newsprint exports from the U. S during 1940 did not exceed 15,000 tons: during 1941 the exports did not exceed 25,000 tons.

**Dept of Commerce figures.



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ROSS CONTROL OF AIR FOR MODERN INDUSTRY SYSTEMS

tons a year. This was achieved despite war shortages of manpower, materials and transportation and in the face of sharply rising costs.

In 1946, on the basis of estimates for the first six months, total shipments from Canadian mills will be 3,696,000 tons—a new high mark which betters the five-year pre-war average by 693,000 tons or 23%. It exceeds the wartime average by 468,000 tons or 15%. From 1945 it is a one-year jump of 437,000 tons.

In 1946 most of the eastern Canadian mills will be trying to meet post-war demand while still under war-restricted wood supply, cut a year or more ago. The estimate of 3,696,000 tons in 1946 is, therefore a demonstration of enterprise and resiliency not easily duplicated by any other industry of similar proportions.

Newsprint Data

It takes 1400 rolls of newsprint weighing 1800 pounds each to print the Chicago Sunday Tribune.

Report on Holland's Paper Industry

If sufficient coal, electric power and pulp are available, Holland will produce 40% of pre-war paper capacity this year, according to Eli de Vries, paper industry advisor to a Dutch economic mission in the U. S. He just made a three months' trip to Holland.

Contrary to reports published last year, he said the big Van Gelder Zonen newsprint mill was not destroyed by the Germans and is in fair condition.

He said three mills were completely destroyed—Papier Fabriek de Maasmond in Raamsdonksveer (whose machines were purchased by Van Gelder Zonen); a tissue mill in Gennep and the Pennekoek mill in Helsum. Other slightly damaged mills will be repaired.

Newsprint Prices

Newsprint manufacturers were granted a $3 per ton price increase March 29, 1945, followed by a $6 increase on Dec. 11, 1945. The latter was the fourth granted by OPA during the war control period, raising the "port" ceiling price from $50 to $67 per ton.

The two 1945 increases were calculated to increase the payments made by U. S. publishers by more than $30,000,000 during this year.

The following are newsprint prices for New York delivery in the 1940-44 period, compared with the corresponding five years of World War I and showing the cumulative percentage increases:

	Price	Pct. Inc.		Price	Pct. Inc.
1915	$41.78	....	1941	$50.00	nil
1916	51.78	24	1942	50.00	nil
1917	63.78	48	1943	54.66	9
1918	64.30	54	1944	58.00	16
1919	79.40	90	1945	61.00	5
1940	50.00	....	1945	67.00	10

Ton of Paper Makes 140,000 News Pages

The American Newspaper Publishers Assn. figures that 140,000 full-sized newspaper pages can be produced from a ton of newsprint. This would figure down to 4666 copies of a 30-page newspaper per ton.

Advertising Climbs

Advertising expenditures in 1944 are estimated well over the $2½ billion mark, and in most probability broke the all-time record of $2.6 billion reached in the boom year of 1929.

New Wet Strength Photo Paper

Eastman Kodak holds a new patent on a photographic paper featuring a special sizing of melamine resin and the aluminum salt of a monobasic acid. The coating is said to impart high wet strength qualities and to increase resistance to blister and frilling when the print is dried.

Comparison Between Number of Companies Producing Newsprint in U. S. in 1926 and 1946

(According to WPB Task Committee)

	Capacity 1926	Tons 1946 (?)
Alexandria Paper Co.	15,000	.....
Algonquin Paper Co.	29,000	.....
Cliff Paper Co.	13,000	.....
Con. Water P. & Pa. Co.	102,000	.....
Crown Zellerbach Corp. (and predecessors)	174,000	(?) 219,000
Cushnoc Paper Co.	20,000	.....
De Grasse Paper Co.	56,000	.....
Dells Pulp & Paper Co.	12,000	.....
Escanaba Paper Co.	370,000	.....
Finch, Pruyn & Co.	44,000	10,000
Flambeau Paper Co.	14,000	.....
Gilman Paper Co.	17,000	.....
Gould Paper Co.	30,000	.....
Grandfather Falls Co.	11,000	.....
Great Northern P. Co.	257,000	300,000
Great Western Paper Co.	20,000	.....
Hawley Pulp & P. Co.	9,000	56,000
Hennepin Paper Co.	12,000	.....
High Falls Pulp & P. Co.	8,000	.....
Inland Empire Paper Co.	29,000	20,000
International Paper Co.	323,000	.....
Blandin Paper Co.	22,000	.....
Maine Seaboard P. Co.	.....	104,000
Manistique P. & P. Co.	20,000	.....
Minn. & Ontario P. Co.	76,000	.....
Nekoosa-Edwards P. Co.	10,000	.....
Northwest Paper Co.	14,000	.....
Oswegatchi Paper Co.	16,000	.....
Oswego Falls Corp.	11,000	.....
Pejepscot Paper Co.	41,000	.....
St. Croix Paper Co.	55,000	75,000
St. George Paper Co.	10,000	.....
St. Regis Paper Co.	115,000	.....
Sherman Paper Co.	16,000	.....
Southland Paper Mills	.....	55,000
Tidewater P. Mills Co.	32,000	.....
Watab Paper Co.	17,000	.....
Waterway P. Prod. Co.	14,000	.....
West End Paper Co.	13,000	.....
Wisconsin River Paper & Pulp Co.	25,000	.....
Total	1,739,000	839,000

U. S. EMPLOYMENT INDEXES SHOWING RELATIVE JOB STABILITY

1923 = 100

	All Manufacturing	Auto	Electrical	Heavy Equipment	Iron and Steel	Paper and Pulp
1932	60.4	53.7	69.6	24.9	65.2	83.5
1933	65.8	60.2	69.7	25.0	68.0	88.9
1934	77.7	88.7	98.8	37.2	82.0	103.5
1935	82.8	95.8	95.5	36.9	88.2	105.2
1936	90.7	103.6	112.7	45.0	104.2	108.4
1937	101.9	116.5	144.6	57.9	118.2	114.2
1938	87.5	71.0	78.9	48.7	89.3	103.4
1939	96.3	91.0	79.9	57.9	98.5	108.6
1940	97.9	103.7	107.4	74.6	112.5	116.8
1941	119.8	114.2	158.4	115.9	130.5	125.8
1942	135.6	n.a.	n.a.	n.a.	131.7	123.3
1943	148.5	n.a.	n.a.	n.a.	125.2	113.2

Source: National Industrial Conference Board.

n.a.: Not available but included in total manufacturing.

EMPLOYMENT, PAYROLLS, HOURS AND EARNINGS IN U. S. PAPER BOX INDUSTRY*

Year.	Indexes of employment and payrolls (1939 = 100) Wage earners	Weekly wages	Average Hours and Earnings Hrs. worked per wk.	Hourly earnings	Weekly earnings
1934	81.3	$66.3	36.6	49.6c	$18.16
1935	84.7	72.7	38.1	49.7c	18.92
1936	90.7	81.7	40.9	48.1c	19.55
1939	99.9	94.9	40.4	51.5c	20.57
1938	91.5	87.3	38.4	54.4c	20.72
1939	100.0	100.0	40.2	54.7c	21.78
1940	102.9	103.3	39.2	56.2c	21.92
1941	117.3	133.7	41.5	60.7c	25.01
1942	110.7	139.8	41.0	67.4c	27.57
1943	120.5	176.8	43.9	73.6c	32.25

*This classification of the Department of Labor includes establishments primarily engaged in the manufacture of fiber cans, cones, cores, mailing cases, ribbon blocks, spools, tubes and similar products; folding and set-up boxes, corrugated and solid-fiber shipping containers, decorated, lithographed, lacquered paper.

Source: Bureau of Labor Statistics, United States Department of Labor.

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More on Labor Relations

(Continued from Page 36)

Publications and Letters

House organs, publications, letters, reports and other written matter have a way of binding closer the ties between employes and their companies. We could write reams about this written material, some of which is indicated in illustrations with this article.

"Years of Paper" — a beautiful publication of the Crown Zellerbach organization is not published very often but when it does come out, it is something for an employe to be proud of showing or having in his library.

The "Log" and the "Annual Report to Champions" are distinctive and high class publications of Champion Paper & Fibre Co.

Nekoosa-Edwards each year issues a statement of company assets and liabilities, production, sales, construction and proposed program of operations in pamphlet form and distributes it to all employes.

Perhaps it would be instructive to observe how Ralph Hayward, president and general manager of KVP, has made practical use of publications.

For over six years Mr. Hayward has periodically written letters which have been sent to the employees' homes, discussing economic problems, plans for the company's future, reports on the company's performance during previous years, etc. KVP has found this method to be a most satisfactory one for getting information into the home where it will be perused by the employee and his family. KVP believes this creates a closer tie. It is only reasonable to assume that such information will be read by the wife and older children and that something of a feeling of kinship with the company is engendered in them. The letters are models of frankness and open-ness.

KVP is resuming this year publication of its plant and Parchment village newspaper.

Among some of the outstanding house organs which are being published in the pulp and paper industry are organs the Union Bag & Paper Corp. in Savannah, at Powell River Paper Co., at some of the Fibreboard mills in the west and at Rayonier's Fernandina, Fla., mill.

Suggestion Boxes

Suggestion systems are one of the best known means to encourage employe interest in company business and at the same time to increase efficiency in the mills. One angle about suggestions which merits considerable thought is whether or not they should be made "anonymously" or "secretly." We needn't go into that issue here but there were a lot of good reasons for both sides given to our editors conducting this survey.

I. J. Harvey, president of the Flintkote Co., summarized the suggestion plan's purpose, which his company has installed, when he said: "In the final analysis, the great and fertile breeding ground for ideas is among the men and women daily on the job."

Some mills pay big bonuses or prizes for a few suggestions chosen in competition; other mills pay more numerous and smaller prizes for any kind of suggestion that improves an operational situation, no matter how trivial.

A suggestion system is utilized at Camas mill of Crown Zellerbach Corp. which rewards anyone for any plan which will ease operational difficulties or effect savings or increase safety or efficiency factors. A monetary award based on net results and figured proportionately to the savings accomplished influences the thought of workers toward practical contributions. Several thousand dollars a year go out in this way, but the awards earn their own way generally speaking, and have the ultimate advantage of proving that employes do not merely accept conditions, but are willing to better them to the best of their abilities by presenting ideas, some of which have been extremely important. When anyone can point with pride to the fact this idea or that suggestion came from his brain and was accepted by his company, the creative impulse and the sense of role are equally satisfied.

Recreation

Recreation should not be ignored as a means of strengthening bonds between management and employes. Where a man finds his fun, he also finds sentimental attachment.

We could list a great many things —the teams with the attractive uniforms supplied by such companies as Union Bag & Paper Corp. and Crown Zellerbach Corp. There are basketball, baseball,. golf, bowling and other teams; some for women, too. When they compete in leagues with other industries or other groups in their community, the interest and loyalty is intensified.

Christmas parties are other "ties." Puget Sound Pulp & Timber Co., in Bellingham, Wash., puts on a really fabulous one every year. The Coos Bay Pulp Corp., Empire, Ore., has been having Christmas parties for six years for employes and their children. Weyerhaeuser mills, likewise, have had great success with these parties.

Typical is the KVP Christmas party at Parchment, Mich. The party is held in the Parchment community house, where there are stage facilities. The community house is decorated in keeping with the spirit of the season. An orchestra comprised largely of people within the plant and a choir from the community provide the musical entertainment. KVP invites renowned speakers in for addresses. At the conclusion of this party each employee receives a Christmas gift. The gift has varied throughout the years from turkeys and baskets of food to, in more recent years, a check in lieu of such food.

In some ways, the development of recreation at the Nekoosa-Edwards mills on the Wisconsin River at Port Edwards is unique, and so we will describe these in some detail. One idea in practice is keeping a record of the sports or games each employe likes best.

The company owns lake property about four miles from the plant which is restricted to the use of employees, their families and friends, where a building is available for group meetings and social gatherings and where picnic grounds and a bathing beach are available.

A restaurant, soda fountain, bowling alleys and billiard and pool tables are also maintained in a building which is adjacent to the plant and in which employees are given reduced rates through the purchase of ticket books.

Soft drink and confectionery dispensers are placed through the mills for the emlpoyee's convenience and milk is distributed throughout the plant during the regular lunch periods.

A community park is located only a short distance from the plant and the company has recently made a natatorium, meeting rooms and recreation rooms. This building will be at the disposal of all employees and community residents.

Victory gardens and canning centers have been sponsored during the past several years with all of the necessary locations, preparations and fertilizing of ground, and incidentals required for the promotion of victory gardens and canning cen-

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War's demands widened both the use of paper and the use of color in paper.

Close to these advances, National Technical Service can be of practical assistance in applying improved coloring techniques to post-war paper products. It includes:

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A complete line of paper-maker's colors rigidly standardized to assure uniform quantity-production results.

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STATE OF WASHINGTON PAYROLLS AND HOURS WORKED

Year.	ALL HAZARDOUS INDUSTRY OF STATE — Payroll	Workmen Hours	Increase or Decrease Compared With Preceding Year — Payroll	Hours Work	PULP AND PAPER MANUFACTURING — Payroll	Workmen Hours	Increase or Decrease Compared With Preceding Year — Payroll	Hours Work
1927	$255,669,929	396,071,584			$4,855,526	7,710,848		
1928	271,223,403	414,002,480	6.08%	4.53%	5,573,223	8,507,600	14.78%	10.33%
1929	288,903,912	437,600,400	6.52%	5.70%	7,845,335	12,275,072	40.77%	44.28%
1930	260,002,808	397,369,096	-10.00%	-9.19%	9,110,285	13,874,832	16.12%	13.03%
1931	188,705,890	317,120,680	-27.42%	-20.19%	6,990,889	11,360,944	-23.26%	-18.12%
1932	131,893,000	255,078,920	-30.11%	-19.56%	5,063,638	8,960,224	-27.57%	-21.13%
1933	129,023,888	260,928,662	-2.18%	2.29%	5,166,375	9,693,579	2.03%	8.18%
1934	161,702,804	284,179,483	25.33%	8.91%	7,435,151	11,835,457	43.91%	22.10%
1935	187,578,233	312,935,429	16.00%	10.12%	8,131,888	12,560,285	9.37%	6.12%
1936	241,960,112	379,926,777	28.99%	21.41%	9,858,151	14,638,927	21.23%	16.55%
1937	286,480,085	412,743,811	18.40%	8.64%	12,607,622	16,305,933	27.89%	11.37%
1938	267,784,196	379,432,496	-6.53%	-8.07%	10,227,766	12,254,194	-18.88%	-24.85%
1939	303,602,602	413,236,113	+13.38%	+8.91%	11,919,822	14,197,262	+16.54%	+15.86%
1940	345,887,756	458,512,732	+13.93%	+10.96%	14,517,595	16,905,387	+21.79%	+19.07%
1941	475,291,383	561,751,286	+37.41%	+22.52%	17,236,948	18,234,058	+18.73%	+7.86%
1942	815,109,078	776,362,062	+71.50%	+38.20%	20,724,118	19,642,765	20.23%	7.73%
1943	1,120,516,847	937,602,553	+37.47%	+20.77%	19,879,950	16,787,877	-4.07%	-14.53%
1944	1,270,266,925	1,003,431,671	+13.36%	+7.02%	21,865,943	17,411,977	+9.99%	+3.72%
1945	979,223,289	787,182,567	-22.91%	-21.55%	21,995,846	17,491,211	+.59%	+.46%

Source: Department of Labor and Industries, State of Washington.

ters provided by Nekoosa-Edwards. Each Fall a Harvest has been arranged at which employees and community residents could display the vegetables, fruits and flowers which they had raised and prizes furnished by the company are awarded.

The personnel department maintains a record, which is taken at the time of employment and revised as necessary, of each employee's recreational pursuits and individual hobbies. This record is used for organizing recreational activities among employees and for acquainting individual employes with others who are interested in the same hobbies.

"Safety" is a subject in the pulp and paper industry which sends some men off in rarified atmospheres of which impractical dreams are made of. To some others, it's just about the most boring subject they ever hear around the mills. Somewhere in between is the right place for safety.

For the purposes of employe morale, which is the subject of this article, several mill executives interviewed agreed that the most important thing to be achieved in any safety system is volunteer employe participation. Some of them also stressed the need for convincing evidence that management is actively interested in safety. Both points were stressed by an Alabama mill executive.

As a typical case, the safety committee at the Everett, Wash., pulp mill of Weyerhaeuser Timber Co. is organized along very much the same lines as those in other plants. It is made up of 30 members evenly

STATE OF OREGON

Year	Payroll	Work Days	Approximate Number Employees
Fiscal Year 1927-1928	$2,691,220.18	581,833	1,939
Fiscal Year 1928-1929	2,946,218.92	640,724	2,136
July to Dec., 1931, Inc.	1,017,435.13	235,114	1,566
Calendar Year 1932	1,896,692.09	504,311	1,681
Calendar Year 1933	1,819,904.95	535,789	1,786
Calendar Year 1934	2,577,436.84	700,842	2,336
Calendar Year 1935	2,984,889.22	778,547	2,837
Calendar Year 1936	3,578,624.01	839,063	2,697
Calendar Year 1937	4,298,917.22	857,696	2,861
Calendar Year 1938	3,207,313.93	596,405	2,052
Calendar Year 1939	3,089,061.69	580,161	2,044
Calendar Year 1940	3,910,458.40	674,075	2,338
Calendar Year 1941	4,800,939.96	742,011	2,577
Calendar Year 1942	5,465,656.77	759,156	2,622
Calendar Year 1943	6,372,006.72	769,963	2,695
Calendar Year 1944	7,028,481.01	877,478	3,006
Calendar Year 1945	7,948,596.83	673,787	2,945

Source: Oregon State Industrial Accident Commission.
Data from July 1, 1929, to June 30, 1931 not available.

CALIFORNIA EMPLOYMENT AND PAYROLL DATA

(Based on all contribution reports submitted to department)

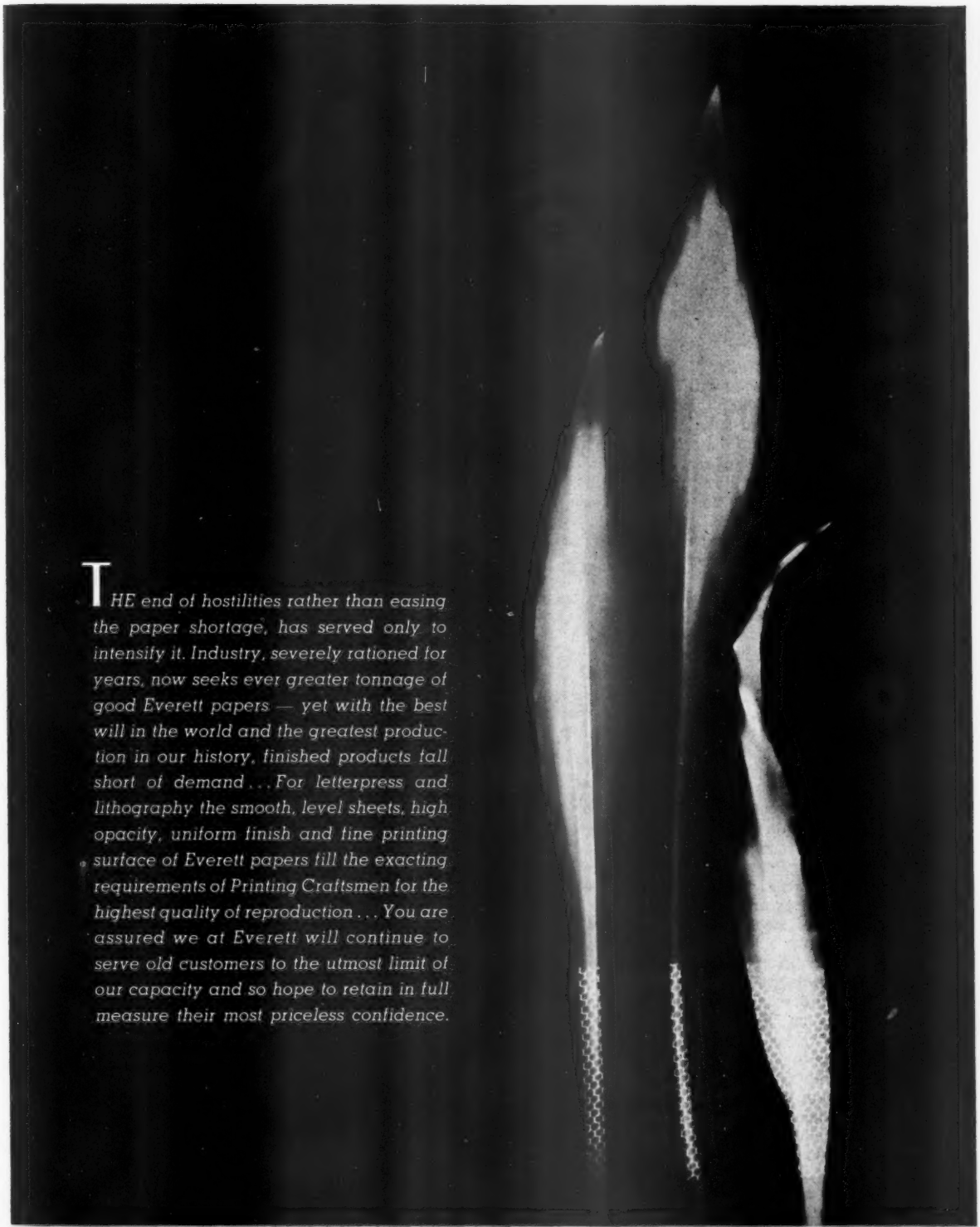
Industry	1943 Total Wages Paid	1943 No. of Plants (a)	1943 No. of Workers Jan.,	1943 Dec.	1944 Total Wages Paid	1944 No. of Plants (a)	1944 No. of Wkrs. Dec.
Total	$19,194,995	136	8,294	8,245	$20,683,393	145	8,712
Coated and Glazed Paper	1,488,545	8	802	634	1,541,469	8	664
Paper Envelopes	1,809,274	14	832	780	1,802,058	14	682
Paper Bags	1,386,903	13	761	740	1,832,669	16	892
Paperboard Containers & Boxes (c)	11,050,975	58	4,419	4,545	6,549,062	53	2,716
Pulp Goods, and Paper Products, not elsewhere classified (b) (c)	3,459,298	43	1,480	1,546	8,958,135	54	3,758

(a) Each branch of a multiple establishment—concern is counted as a separate establishment.

(b) Includes branches of such firms as pulp mills, paper mills and paperboard mills.

(c) Note considerable change between years 1943 and 1944 in classifications "Paperboard Containers and Boxes" and "Pulp Goods and Paper Products, not elsewhere classified." This is due to changing industrial classification of firms manufacturing paperboard as well as making containers and boxes from "Paperboard Containers and Boxes" group (firms fabricating containers from purchased stock) to "not elsewhere classified" group.

Source: California Department of Employment affiliated with Social Security Board Report 127A, No. 47 for 1943, No. 52 for 1944.


THE end of hostilities rather than easing the paper shortage, has served only to intensify it. Industry, severely rationed for years, now seeks ever greater tonnage of good Everett papers — yet with the best will in the world and the greatest production in our history, finished products fall short of demand . . . For letterpress and lithography the smooth, level sheets, high opacity, uniform finish and fine printing surface of Everett papers fill the exacting requirements of Printing Craftsmen for the highest quality of reproduction . . . You are assured we at Everett will continue to serve old customers to the utmost limit of our capacity and so hope to retain in full measure their most priceless confidence.
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LOS ANGELES

divided between labor and management and includes one employe from each department and all the foremen.

The present committee chairman is an hourly paid man and all members of the inspection committee are on the hourly pay basis.

In Michigan, the KVP Co. has a safety committee with representatives from various sections of the plant, whose function is to assist the safety supervisor in carrying out a plant-wide program. This system, so commonly used but little thought of from this angle provides just another avenue by which employes are made to feel they are playing a vital part in company endeavors.

At Nekoosa-Edwards, they call it a "Workmen's Safety Committee", the members of which are selected to represent all operating departments. These committeemen serve for a term of one year and have an opportunity in the monthly meetings to express themselves with regard to plant safety, housekeeping, sanitation, or any problem concerning the employees' working conditions, health and welfare.

Accident prevention receives high priority in Pacific Mills organization in Canada, where a joint labor-management committee deals with all phases of safety.

Here is the way one safety supervisor summed it up:

"Safety programs are employed nearly everywhere because they always pay in bettered relationships. That a company is interested in saving men from accidental injury or worse appeals to the men's own instincts of self preservation. From an employer's standpoint, the definite result of any such program is plant cleanliness which of necessity resolves itself into more efficiency."

Whether the company operates with a committee working under the personnel department as at Pulp Division, Weyerhaeuser Timber Co., Longview, Wash., where 10 men are appointed every six months with the cooperation of and in conjunction with the union, together with 5 supervisory members on behalf of the company, or whether the program actually heads up in the office of a Safety Supervisor in each mill who works under a general safety supervisor for all mills, as in Crown Zellerbach Corp., ends achieved are the same: bettered relationships, more efficiency.

First Aid training follows along as an adjunct to any safety program. Such training of itself makes employes safety conscious. If men are aware of the effects of injuries, no special stress need be placed on accident prevention; such grows from it.

Few companies employ First Aid instructors; Crown-Zellerbach is the exception on the west coast. But in California, the states of Oregon and Washington, the state governments make available to industry first aid instructors, but there are so few they must be spread out thinly. Some big companies feel it pays to have their own.

Pension-Retirement Plans

Albert Bankus, vice president in charge of operations for Crown Zellerbach Corp., put his finger on real value of insurance-pension-retirement plans which are being adopted these days in the pulp and paper companies all over the continent. He said: "They reach everybody."

Kimberly-Clark Corp. has one of the most elaborate set-ups in the industry of multiple benefit plans for its big payroll of employes. Without going into detail, it may be interesting to note that Kimberly-Clark offers group insurance, Blue Cross hospitalization, MBA memberships, the K-C pension trust, paid vacations, 5-day sick leave program, and in addition for vets, plans for school, job training, etc. Of course, these are not unique but represent quite an array of offerings.

Notable among the retirement plans in the industry are those of Scott Paper Co., and of the Southern Kraft Division of International Paper Co. The latter plan, while announced only recently, has been made effecive as of Jan. 1, 1945. Employee financial participation began Feb., 1946. The retirement age is 65. Qualifications for eligibility are regular full-time employment, employee must be age 30 or over, five years of service since any break in the service of more than 12 months. Absence for military service is not considered a break.

The normal annual retirement allowance commencing at age 65 and payable for life is made up as follows: (1) For each year of membership service after Jan. 1, 1945, and before age 65 an annual allowance of ¾ of 1 per cent of the compensation received during each year of such service, up to $3,000, plus 1½ per cent of the compensation in excess of $3,000 but not over $15,000; and (2) For each year of prior service before Jan. 1, 1945 (but after the first five years and after reaching age 30) an annual allowance equal to ½ of 1 per cent of the annual rate of compensation on Jan. 1, 1945, up to $3,000 plus 1% of such compensation in excess of $3,000, but not over $15,000.

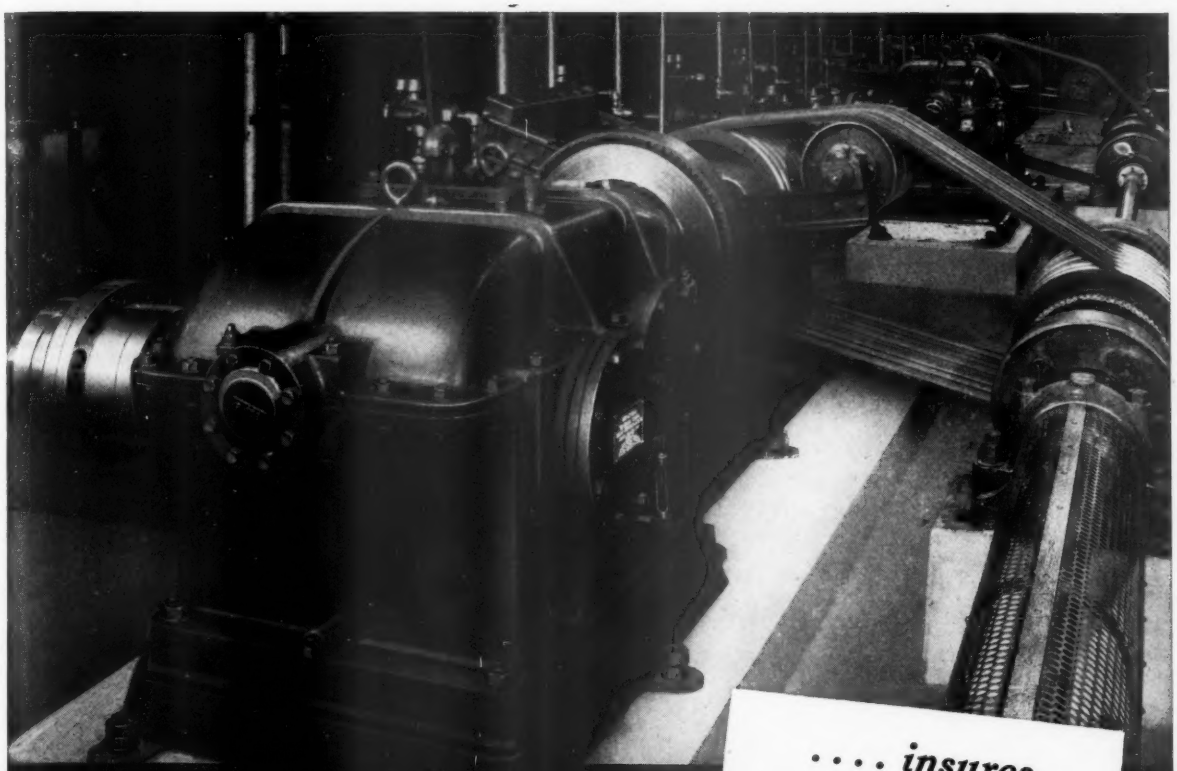
Employe members in the retirement plan after Feb. 1, 1946, will pay 2¼% of his compensation up to $3,000 a year, plus 4½% of that part of his compensation over $3,000 but not in excess of $15,000 a year.

In the Scott Paper program the company will bear the cost on a retirement plan for all employees with incomes up to $5,000, and on earning beyond that figure an employee contribution of four percent is required. This plan, too, is retroactive to January, 1945 and present employees will received credit for part service up to fifteen years. Retirement age is 65, although employees may retire at 55, after 20 years continuous service, at a reduced benefit. The plan is to include Scott mills after the fifth anniversary of acquisition. The subsidiaries at Anacortes, Wash., and Coos Bay, Ore., became participants Jan. 1, and the mills at Marinette, Wis., and the older mill at Glens Falls, N. Y., on next Jan. 1.

Many another company was taking a look at pension or retirement plans, or getting set to refurbish old ones. Significant is the fact that at a recent meeting of the Portland, Ore., chapter of the National Association of Cost Accountants the pulp and paper industry was chosen to furnish the principal speaker. This was Frank A. Drumb, San Francisco, then director of public relations for Crown - Zellerbach Corp. and now an operations executive. Mr. Drumb outlined eight motivating ideas behind any retirement plan:

1. To make payroll savings by retiring superannuated employes.
2. To offer employes greater security.
3. To fund the retirement expense while the emloye is sound; like setting up depreciation reserves on machinery.
4. To keep the organization young and offer more promotional opportunities, which in turn may help profits.
5. To reduce operating costs by reducing turnover.
6. To help in recruiting new employes.
7. To build up community goodwill.
8. To take care of this social problem so that the government will be less inclined to paternalism.

He held none of these to be predominant, but a vital consideration was: "How much can the company spend in bad times as well as good?" In the case of Mr. Drumb's com-



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Savings in belt costs through longer belt life.

Greatly reduced maintenance costs.

Requires no basement or mezzanine; saves floor space.

Saves cost of structural steel for supporting line shaft or cost of piers.

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Fine draw regulation, exact draw maintenance — those indispensable requirements of paper machine operators — are assured by this new achievement of Sandy Hill engineers. Combines simplicity of design with trouble-free operation, power-saving economy, safety and low first cost.

Unvarying draw between sections is provided through Sandy Hill's particular design involving effective use of V-belts and sheaves. There is no detectable slippage in the V-belt feature of the drive, and the speed regulation made possible by the variable pitch V-belt sheaves is beyond the range of other mechanical combinations. Gives twice the draw range of the cone pulley and flat belt.

Sandy Hill Selective Drive can reduce operating costs for you. Write for circular showing drawings and explaining construction details.

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These felts retain their qualities of long life, low cost, and high porosity that have made CALCOT dryers favorites among Pacific Coast paper makers for many years.

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pany, a staff employe was first set to make a study of all retirement plans and a committee representing both labor and management was set up with a secretary to do research. Result was eventually a plan acceptable to directors and employees alike.

Greater security is in the future, too, for employees of Harvey Paper Products Co., Sturgis, Mich., through revision of the company's group insurance plan. Underwritten by a large life insurance company on a cooperative basis, employees contribute fixed amounts and the employer adds the balance of the net cost. Employees now receive payments of $10.50 to $14.00 per week in case of illness or injury, five dollars per day if hospitalized, and up to $150 for surgery. Payments of four dollars per day are made when an employee's dependent is hospitalized, and up to $112.50 for surgery. A visiting nurse service is also provided.

When an employee comes to work for Nekoosa-Edwards Paper Co., the company subscribes to a one thousand dollar ($1000.00) straight life insurance policy in his name without any cost, examination or obligation on the part of the employee. This policy remains in effect as long as the employee remains on the payroll. Upon termination of employment the employe may continue this insurance through arrangements made with the insuring company.

Also among the employee benefit plans reported to PULP & PAPER INDUSTRY is one by Hammermill Paper Co., Erie, Pa. In Sept. 1945 all Hammermill employees having a minimum of one year's service were awarded $1,000 of principal amount of life insurance under a group life and accident insurance contract. This added protection was provided at company expense with an understanding that its continuation will be subject to the company's ability to maintain a satisfactory earning position.

In Canada, each company has its own ideas as to the best form and varying conditions have influenced the choice of program. Powell River Co.'s pension program, affecting some 1600 employees, was put into effect last year and because it embodies many of the more acceptable features incorporated in modern practice some details of its operation are here presented.

Annuities arranged under the plan will be provided by the Canadian government under a master group contract issued by the annuities branch, Department of Labor, at Ottawa. The total contributions which can be made, both by the company and the employee cannot exceed an aggregate amount which, when added to the total payments held for the account of the employee, are sufficient to purchase a maximum annual annuity of $1,200, or $100 monthly.

Returning Veterans

We haven't gone into a discussion in detail here of the set-ups in mills for handling returning war veterans and making them feel they are welcome and important to the company for which they work. That subject has been discussed pretty thoroughly in previous issues of PULP & PAPER INDUSTRY. A number of mills saw fit to appoint veteran's counsellors to direct this job—often a returning vet himself. Others carried on with their existing personnel office and methods. Others used committee methods.

It may be of interest here to mention a program adopted by Rayonier Incorporated for its Washington and Florida mills. Resident managers some time ago wrote personal letters to all Rayonier men in the armed services advising them that they were wanted the moment they returned. To lend emphasis to this expression, enclosed was a photostat of a letter from Edward

Bartsch, president, to resident managers on the subject, indicating his strong interest in veterans' return to the organizaion. That the plan is working well is illustrated by the Grays Harbor mill, for example, where more than 90% of those on leave and in the armed forces are back at work, and 75% of employees who entered the service are back. Rayonier has had a definitely crystallized attitude in adjusting ex-service men to their old jobs. It is "sincerity and naturalness—avoid the sentimental."

Several companies are doing an outstanding job of "follow-up" checking on veterans, to be sure they are properly placed and satisfied and getting along well in every way. If not, changes are made.

Woods Labor

Finally, it may be stressed that ways and means of getting labor into the woods again is one of the greatest worries of this industry today and this is definitely a question of employe-management relations. It is a problem which has some of the best minds in the U. S. South scratching their heads. Should living quarters in woods be company or private owned? How can living quarters be improved?

In eastern Canada, pulp and paper companies are now introducing methods which they hope will result in increasing the number of their year-round employes. In the past, woods operations have been regarded as purely a seasonal occupation, most of the wood cutters and haulers and men engaged in the river drives working on farms during the summer months. This has led in some instances to the woods personnel regarding their relations with the pulp industry as secondary or merely a side-line. This attitude naturally affect all-round efficiency to some extent, and the industry hopes that by introduction of more mechanization, better housing and recreational facilities and job training it will be possible to maintain much larger forces of year-round labor, interested in making their work for the pulp mills their permanent livelihood.

Some Conclusions

But in all this discussion of material benefits, better living quarters, parties and recreation and even luxuries, it might be well to recall the observation made at the beginning of this article—that working conditions alone or even wages are not the secret of better employe-managements relations. It is the, rather, the sense of "role" and importance in the employe's own heart.

Some men we interviewed said put employes "on their own"—don't "baby" or "pamper" them. There was the case sited of a logging operation that built modern bunkhouses and fancy quarters for its big crew but couldn't increase production. Some one hit on the scheme of dividing the crew into competing units and the engendering of a competitive spirit accomplished what "luxuries" could not accomplish.

An other point which many persons interviewed by our editors stressed—real evidence of a desire for cooperation on the part of an employer must come first in an effort to break down an almost traditionally negative attitude on the part of an employee, and is a fundamental must in preparing a foundation for a smooth pathway for labor-management cooperation.

This evidence of a desire for fair play on the part of management cannot be simulated, it must be honest and sincere and it must originate with top management and be plainly evident in the attitude of all management representatives, and especially the foremen.

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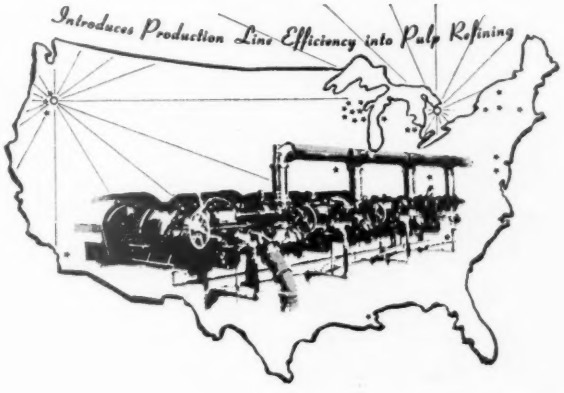

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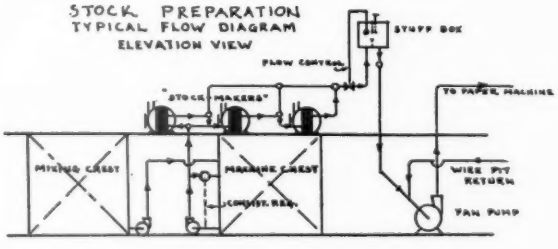

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Plastics

(Continued from Page 134)

tureproof film laminated to paperboard also helped solve the container shortage when tin became scarce, finding use for shortenings, edible oils and paint. A metal-replacement package consisted of a cellophane bag inside a pre-fabricated box, used to package frozen eggs.

Sealed cellophane bags packaged millions of pre-frozen aluminum alloy rivets, used in fabricating planes, keeping the fasteners at required low temperatures for use in assembly lines.

Laminates were used in place of heavy grease to protect rifles for shipping and to package plane, tank and automotive parts. Cellulose-acetate film was laminated to foil for use in packaging highly hygroscopic, or water-absorbent food products and medical supplies.

Predictions of Cellulose Use

A Committee for Economic Development study has predicted that the plastics materials industry of the U. S. will increase 161% in 1947 over 1939 in dollar value of products. However, the CED estimated this value in 1947 would be only $203,300,000 as compared with the War Production Board records showing the sales volume of plastics and synthetic resins totaled $332,000,000 in 1944. Apparently, the CED was taking a more restricted view of what constitutes the plastic industry but, at any rate, its forecast of a 161% boost would be a fairly authentic gauge for measuring possible pulp and paper industry business in this field.

This compares with the CED predictions of 58.2% increase in plywood; 133% in rayon; 67% in electrical appliances, and 71% in automobiles in the year 1947 over value of those products in 1939.

If a Civilian Production Administration forecast that 500,000 passenger cars a month will roll off assembly lines beginning in June comes true, then, according to Modern Plastics, over 27 million pounds of plastics materials would be required for the cars manufactured in the last seven months of 1946. This is based on the percentage of plastics that went into automobiles in 1942. About half of that amount of plastics material could be made from wood pulp.

(Cotton linters compete with wood pulp as base material for cel-

lulosic plastics but the use of wood cellulose is increasing and is especially high in cellulose nitrate, ethyl cellulose and is increasing in cellulose acetate.)

Incidentally, several new automobiles have been projected which would have completely plastic bodies.

Here's another interesting forecast: If the same number of refrigerators are produced in 1946 as the base period, 1940-1941, they will utilize 500,000 lbs. of cellulose acetate and cellulose acetate butyrate and 18,500,000 lbs. of various laminates.

About 6,000,000 small radios were produced in 1941 and 4,000,000 were housed in plastic cabinets. It is estimated nearly 8,000,000 small radios will be produced in 1946 and 70% will be in plastic cases.

A review of many other categories of products using cellulosic plastics, indicates the demand will be far in excess of what has been the actual production of those materials during war years.

The Plastics Division of Celanese Plastics Corp. has stated that currently it can take care of about 25% of the demand for cellulose acetate molding in the New York area and that nationwide it was running 50% behind demand for cellulose acetate sheeting.

The Plastics Materials Manufacturers' Association has issued reports indicating the industry will be producing 8,000,000 lbs. of molding material each month by mid-1947 as compared with about 6,000,000 lbs. in early 1946. Ethyl cellulose (a good user of wood pulp) is being widely used now in applications formerly requiring cellulose acetate and cellulose acetate butyrate. The association predicts production capacity of 800,000 lbs. monthly at the end of the war will jump 36% by early 1947. Cellulose nitrate (an old wood pulp standby) was expected to show a 50% increase this year over 1944 output of 16,000,000 lbs. but only go up again very slightly in 1947.

In order to get near an accurate picture of the cellulosic plastics, it is well to observe that many users are putting in duplicate orders in hope of getting more. But at present the newcomers are finding it difficult to get any part of the limited cellulose supply.

The development of new synthetic materials, such as rubber derivatives, the vinyl resins, the methacrylate resins and cellulose derivatives has proved immensely valuable to the paper coating and packaging industries. These new materials have not only provided new ideas and trends and new beauty but also a degree of protection previously unknown. Although the rising interest in protective coatings for paper was already manifested in a number of new applications before the war, there is no doubt that the more stringent demands of a military emergency have greatly accelerated this trend.

One distinct advantage of these new synthetic resin materials is their ability to seal with the aid of heat and pressure. This fact has greatly increased production since the seal sets as soon as the temperature at which the seal was made drops a few degrees. Bonds made with these resins are strong, flexible, waterproof and do not deteriorate with age.

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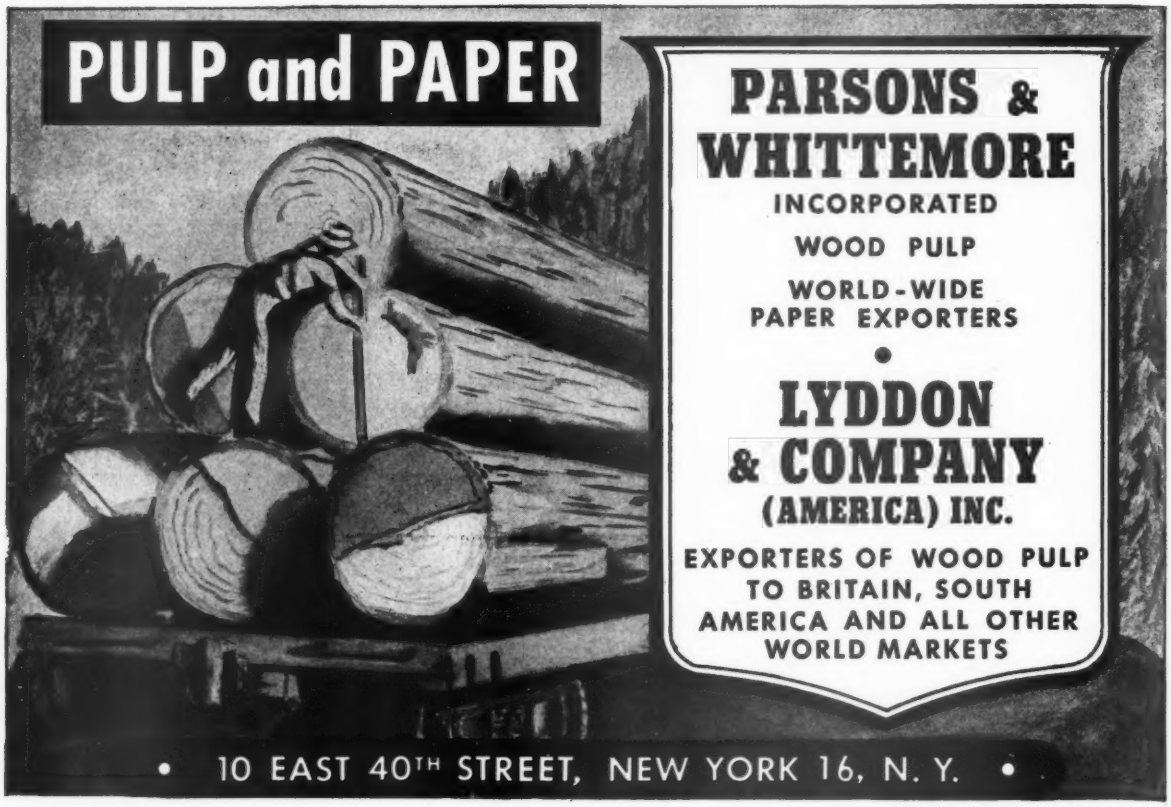

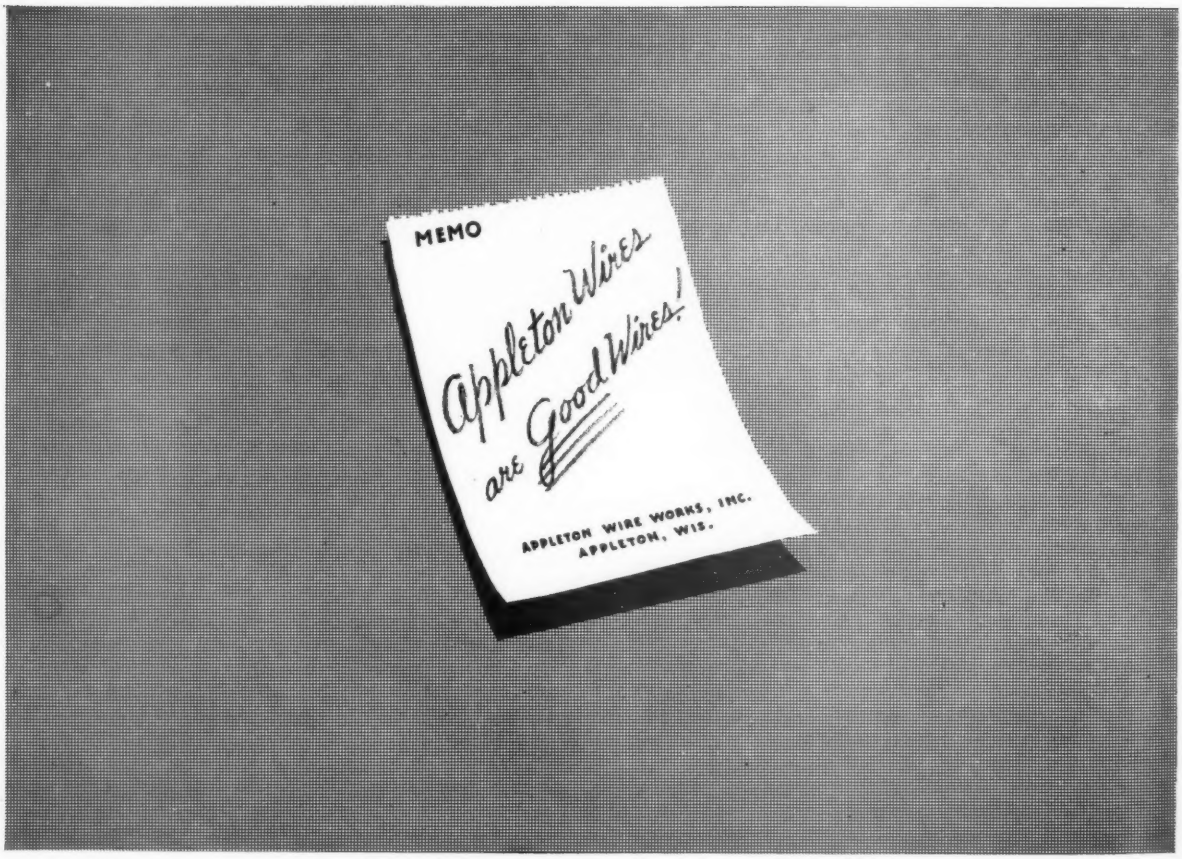

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